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BRITISH MEDICAL JOURNAL

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SATURDAY DECEMBER 22 1945

TABLE OF CONTENTS

B.L.A. Medicine ERNEST BULMER, M.D. 873

Estimation of Serum Proteins HANS HOCH, PH.D., and JOHN MARRACK, M.D. 876

Tests of Liver Function in Infective Hepatitis M. R. POLLOCK, M.B. 878

Management of Recent Fracture-dislocations of Cervical Spine A. N. GUTHKELCH, F.R.C.S. 880

Therapeutic Efficiency of Ultra-violet-light Apparatus B. C. ELLIOTT 881

Anti-M Iso-agglutinins in Human Serum MARJORY MCFARLANE, M.D. 883

MEDICAL MEMORANDA

Treatment of Chilblains by Para-vertebral Sympathetic Block. H. J. SIMMONS, M.B. 884

Acute Haemolytic Anaemia due to Sulphonamides. F. B. COCKETT, M.B. 884

Duodenal Atresia in a Newborn Infant. PATRICIA LEITCH, M.B. 885

GENERAL ARTICLES AND NEWS

Lessons of Wartime Experience 891

European Health Problems 892

Nova et Vetera: Benjamin Rush 893

L.C.C. NURSING RECRUITMENT 892

LONDON COUNCIL OF SOCIAL SERVICE 893

PORT HEALTH SAFEGUARDS 893

THE SERVICES 906

UNIVERSITIES AND COLLEGES 906

MEDICAL NEWS 906

REVIEWS

Surgery of the Hand 885

Microbial Antagonisms 885

Telepathy and the Group Mind 886

Oto-rhino-laryngology 886

Notes on Books 886

LETTERS AND ANSWERS

Nodule at Site of A.P.T. Injection—Treatment of Syphilis — Weight of Enlarged Prostates — Tuberculin-tested Milk — Sudeck's Arthritis — Soapless Shampoos — Signs of Virginity — Thought and the Electro-encephalogram—The "Highly Strung" Child—Symptomatic Treatment of Cough—Diet in Chronic Interstitial Nephritis—Tuberculosis and Diabetes — Income Tax—Permanent Holiday Camps for Children?—Knyveton's *Diary of a Surgeon*—Liver Extracts—Destruction of Adult Schistosomes—Podophyllin for Warts—Correction 908-10

Epidemiology Section 907

LEADING ARTICLES

Carbon Monoxide Poisoning 887

Surgical Science in England 888

ANNOTATIONS

Ocular Signs of Ariboflavinosis 889

Recurrent Paroxysmal Abdominal Pain 889

Human Listerellosis 890

Efficiency of Ultra-violet Apparatus 890

REPORTS OF SOCIETIES

ROYAL SOCIETY OF MEDICINE 894

NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY 894

OBITUARY

L. C. Bruce, M.D., F.R.C.P.Ed. 903

G. Arbour Stephens, M.D. 904

H. M. Moran, Ch.M., F.R.A.C.S. 904

Margaret Balfour, C.B.E., M.D. 904

G. A. Maxwell Hendry, M.B. 905

Robert Gordon, M.D. 905

J. C. Buckley, M.D. 905

Thomas Aubrey, M.B. 905

E. W. S. Hughes, M.R.C.S. 906

E. A. Parsons, M.R.C.S. 906

T. W. N. Barlow, M.R.C.S. 906

H. E. Rutherford, LL.D., M.B. 906

CORRESPONDENCE

Tropical Medicine. A. R. D. ADAMS, M.D., and others 895

Medical Future of the Colonies. K. B. WELLESLEY COLE, F.R.C.S. 895

SUPPLEMENT

Insurance Acts Committee 133

Staffing of Middlesex County Hospitals 134

CORRESPONDENCE 135

MEDICAL WAR RELIEF FUND 136

BRANCH AND DIVISION MEETINGS 136

CORRESPONDENCE—*contd.*

"Geomedicine." J. SEIDE, M.D. 896

Losses of Polish Medicine. LEON DMOCHOWSKI, M.D. 896

Glandular Fever and Infectious Mononucleosis. Sir HENRY TIDY, M.D., and E. B. MORLEY, M.B. 896

Anaesthetic Risks. D. C. DEVITT, M.R.C.S., and M. V. H. DENTON, M.R.C.S. 897

Acute Yellow Atrophy after Trilene. A. H. MUSGROVE, M.R.C.S. 897

Spinal Analgesia. R. J. MCNEILL LOVE, F.R.C.S.; STEPHEN POWER, F.R.C.S. 897

Spinal Analgesia in Operative Obstetrics. A. D. H. SIMPSON, M.R.C.S. 898

Crooke-Meligren Cells. N. G. B. MCLETCHIE, M.D. 898

Galvanic Stimulation of Denervated Muscle. R. G. ABERCROMBIE, M.D. 898

Midwife's Responsibility in Placenta Praevia. A. W. PURDIE, M.B. 898

Treatment of Varicose Ulcers. R. R. FOOTE, M.R.C.S.; P. L. RENOUF, M.B. 899

Artificial Pneumothorax Refill. PETER EDWARDS, M.B.; B. G. RIGDEN, M.R.C.S., and PHILIP STEEN, M.D.; RAYMOND WILLIAMS, M.R.C.S.; P. MCA. ELDER, M.B.; G. M. MAYBERRY, L.R.C.P.I. 899

Treatment of Early Syphilis. C. HAMILTON WILKIE, M.D. 900

Tobacco Smoking and Health. V. J. KINSELLA, F.R.C.S. 900

Nylon for Buried Sutures. T. RUSSELL STEVENS, F.R.C.S. 901

Pasteurization of Milk. H. TUDOR EDMUNDS, M.B. 901

Research into Tuberculosis. S. M. HILTON, M.B. 901

Physical Therapy in Mental Disorder. D. W. WINNICOTT, F.R.C.P. 901

Future of Venereology. A. J. KING, F.R.C.S. 902

Scalenus Anticus Syndrome. H. O'MEARA, M.B. 902

Staffing of County Hospitals. A. D. MARSTON, M.R.C.S., and W. ALEXANDER LOW, M.B. 902

Buying and Selling of Practices. E. H. STRANGE, M.R.C.S. 903

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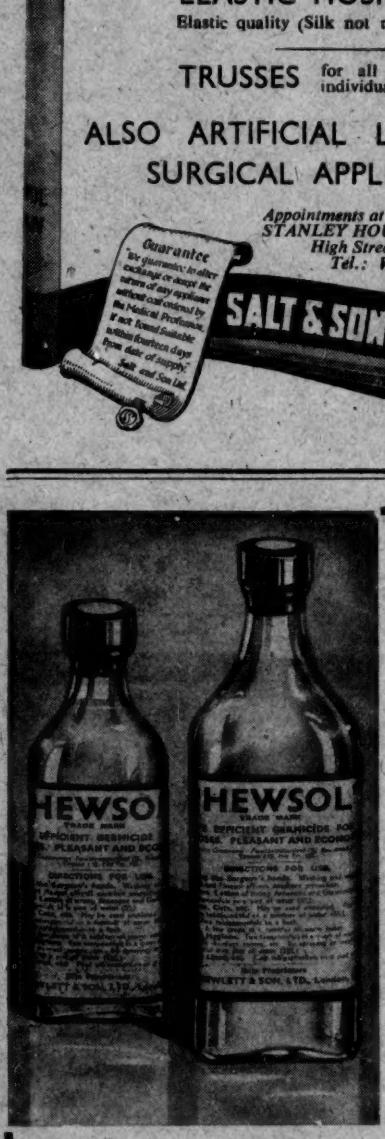

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 22 1945

B.L.A. MEDICINE

BY

ERNEST BULMER, C.B.E., M.D., F.R.C.P.

Lately Brigadier, Consulting Physician, 21 Army Group; Honorary Physician, Birmingham United Hospitals

FOREWORD BY
Field-Marshal SIR BERNARD MONTGOMERY

"I should like to take this opportunity to pay a tribute to the great work done by our doctors during the campaign in North-Western Europe. It was often unspectacular work, as may be judged from the constantly recurring reports, 'Sickness rates remain low.' But as the result of the immense pains taken our great armies in B.L.A. were far healthier than the armies of the last war; this was achieved in spite of the fact that active large-scale operations continued at a high pitch throughout the campaign, and did not stop during the autumn and winter, when we experienced the worst possible weather conditions.

"The doctors of the B.L.A. can be justly proud of the results which they achieved; these results produced a force ready at all times to meet the great calls made on its endurance and physical fitness. Our doctors have in fact played no small part in the achievement of final victory in Europe."

B.L.A. surgery has been admirably dealt with by Porritt, Debenham, and Ross (1945), and reference should be made to their paper for the operational side; physicians were busiest during static periods, and in battle their work in forward areas was chiefly with chest injuries. Modern warfare in a temperate country has proved a healthy thing, and, unlike the Middle East, North African, and Far Eastern campaigns, medicine has been content to take a second place to surgery. Nevertheless the problems presented to the physician during the several phases of the campaign were varied and urgent, and in the German phase the unexpected responsibility of dealing with mass starvation strained both resources and ingenuity.

I propose to survey the field broadly, and to deal only with the twelve months I was in the theatre—July, 1944, to July, 1945. The observations of the consulting physician to a force of this size must be superficial, as they must equally be extensive; it is anticipated that papers will be published by those who had the opportunity of day-to-day studies, and it is not possible for me here to acknowledge the source of all my remarks.

The Medical "Set-up"

There were complete medical departments in the large base hospitals, with physicians, dermatologists, psychiatrists, venereologists, and neurologists. The field force had experienced physicians in casualty clearing stations and 200-bed hospitals, but they lacked full ancillary services; during battles they co-operated with the surgeons, largely in the treatment of chest wounds, while between battles they were very busy treating the sick. Light sick and skin cases were held in minor medical units with supervision from the nearest physician or dermatologist. The handling of venereal and psychiatric cases was separately organized under the respective Advisers—Lieut.-Col. D. J. Campbell and Lieut.-Col. D. J. Watterson; it will not be discussed here. The whole medical service was co-ordinated by the D.M.S. with the advice of his consultants and advisers in special subjects; a noteworthy feature was the agreed policy arrived at after regular conferences between the administrative and professional sides.

Low Sickness Rates

In each quarterly report I have had to repeat "Sickness rates remain low"; from June, 1944, until April, 1945, they averaged 23.6 per 1,000, which compares with 53.9 per 1,000 for the B.E.F. (1914–18) fighting in the same country. The reason for this very low rate needs critical examination by hygienists and statisticians, but my own suggestions are:

1. *General Management.*—The Force was carefully selected physically and part of it was selected psychiatrically. It was trained to a high pitch of fitness; both men and clothes were kept clean; food was generous in amount and water discipline was good.

2. *Infestation.*—In 1914–18 it was said that nearly half the sickness was due to infestation—trench fever and infected pyodermias, from either lice or acari. In the B.L.A. the louse was virtually abolished by personal hygiene and D.D.T., and scabies rarely became a problem, as prompt treatment with benzyl benzoate by the regimental medical officer was usually effective.

3. *Changed Conditions.*—We were spared long periods of trench warfare, although we had a dusty summer, a wet autumn, and a bitter winter.

4. *Good Fortune.*—There was no influenza pandemic.

Other Comparisons with the B.E.F. (1914–18).—We had four times as much jaundice and twice as much diphtheria; until April, 1945, the V.D. rate was just a little less; our incidence of enteric fever was 1/200, of cerebrospinal meningitis 1/4, and of pneumonia 1/6: these figures are computed on case rates per 1,000. Chemotherapy showed an improvement in case mortality: we had 1 death from cerebrospinal meningitis in 35 cases; in the B.E.F. it was 1.17%; our pneumonia mortality was 1% against 12.4%, while we had no deaths from dysentery against 0.6%.

Diarrhoeal Diseases.—In Normandy the incidence was high, and accounted for 31% of medical admissions. In the winter it still continued, and between 6 and 8% of medical admissions were diarrhoeal: its control is still imperfect.

Respiratory Diseases.—These constituted 32% of medical admissions from Jan. to March, 1945; there is a seasonal rise at this time of year, and living conditions had changed—houses instead of an open-air life. In other words, spacing was the only method of control of these droplet-spread diseases under the prevailing conditions, and it was not very effective.

General Comments on the Sickness Trends.—Much was achieved by fitness and cleanliness, by the eradication of the louse, and by the prompt treatment of scabies, while good water discipline and inoculations played an important part. Diarrhoeal diseases are but partially controlled, and droplet infections are almost uncontrolled: these facts are stressed to counteract complacency. The accompanying Table shows the varying incidence of certain diseases by quarters, expressed as percentages of 50,000 medical admissions.

Table showing Quarterly Incidence of Disease (Percentages of Medical Admissions)

Disease	July–Sept., 1944	Oct.–Dec., 1944	Jan.–Mar., 1945
Acute diarrhoea	31	8	6
Respiratory diseases	14	25	32
Infectious diseases	5	8·5	10
Skin diseases	18	15	16
Chronic rheumatism	4	6	3·5
Dyspepsia and ulcer	3	5	4
Acute infective hepatitis ..	1·5	3·1	4
Renal diseases	1·5	3	1·5
Malaria	11	2	1
Sciatica	1	1	1
Organic nervous diseases ..	1	1·5	1·5
Cardiovascular diseases ..	1	1	1

Phases of the Campaign

The campaign divided itself into three parts, each with its own problems; in each phase there were variations in seasons, living conditions, and prevalence of communicable disease in the civil population. Finally there were the problems of the civil side when Germany was overrun.

Phase 1: Normandy (June–Aug., 1944).—During the beach-head days of dust, flies, mosquitoes, and improvised accommodation (tents or foxholes) the prevalent disease was diarrhoea; it was christened the "Normandy glide," perhaps from the lessened urgency of its demands on Middle East standards. Many troops had come from malarious parts of Sicily and Italy, and their malarial relapses became a serious problem, as man-power was short. Weil's disease, although a very minor problem, made even jaundice interesting, while an outbreak of 80 cases of typhoid fever in one small headquarters mess exercised both hygienists and physicians. Droplet infection was negligible and the V.D. rate low.

Phase 2: The Low Countries (Sept., 1944, to March, 1945).—A wet autumn, a bitter winter, houses instead of open-air life for most, friendly and populous countries, and endemic diphtheria in the part of Holland then liberated—this was the background. Droplet infection became rife, and this would not have mattered had it been no worse than the colds we all got on going into houses; sore throats were prevalent, and each might be diphtheritic in view of the epidemicity of the disease. The negligible V.D. rate rose briskly, malarial relapses almost disappeared, but dysentery simmered constantly. The anticipated late autumn outbreak of jaundice did not materialize, but the incidence rose steadily.

Phase 3: Germany (April to July, 1945).—Although the Rhine was crossed in good weather the later spring and summer were wet; the troops again led a more open-air life. The disease problems were those expected, although dysentery did not become a big problem as in Normandy and sore throats still were very widespread. The V.D. rate continued to rise. Our own troops did not give us much anxiety, and even Weil's disease still remained where we had left it—in Normandy—although there were plenty of water in Holland and Germany and infected rats. Our chief worries were from civilian internees and liberated prisoners of war—typhus, starvation, and tuberculosis.

Malaria

About 30 men who had not been in malarious zones contracted malaria in Normandy; there were numbers of men harbouring gametocytes, and anophelines were identified in the Caen sector—this was not our main preoccupation. In the Force there were about 40,000 men who had served in Sicily and Italy. Many had had previous attacks of malaria, and relapses were anticipated; others had been infected late in the previous malaria season, and had their "delayed primary attack" in Normandy. About two-thirds of our cases were relapses and one-third were delayed primary attacks.

Before the invasion a rather alarming number of malarial attacks occurred in the training areas in the United Kingdom among the ex-C.M.F. contingent. An attempt was made to prevent further relapses by resuming suppressive mepacrine or by giving intensive courses of mepacrine for a week to men in the infected divisions. The effect on the relapse rate was negligible, and our final conclusion (which is widely held) was that the only way to cut down the relapse rate of B.T. malaria was to secure adequate treatment of each patient when he was actually in a relapse, and that pamaquin (plasmoquine) must be included in this treatment. Up to the middle of July, 1944, I estimated that there had been between 800 and 1,000 cases in Normandy; from then until the end of September there were a further 1,100 cases (11% of the medical admissions). The problem became an urgent one of man-power conservation. At first all cases had had to be evacuated to the United Kingdom, but from the middle of July the majority were treated in Normandy.

Treatment.—The first step had been to put malaria relapse in its right perspective—a trivial and short-lived illness. We decided on three treatments:

1. *5-day Course.*—This was a measure of expediency used in the early days with the object of getting men back to duty in about 7 days. Quinine bihydrochloride 30 gr. and pamaquin 0.03 g. were given concurrently and daily for 5 days.

2. *10-day Course.*—As soon as beds became available all relapses and delayed primary attacks had quinine–pamaquin for 10 days.

3. *21-day Course.*—If a man had three relapses in one season he was given the above course of quinine–pamaquin for 7 days, and then two-thirds the dosage for 14 days.

While the 10- and 21-day courses seem to be the best so far achieved, much has yet to be done to remove the problem of the B.T. relapse.

Acute Diarrhoeal Diseases

These were rife, but were mild on Middle East standards. The aetiology was not worked out on a large scale. Infection by the food-poisoning group seemed to be exceptional, and most cases of diarrhoea were dysenteric: this statement is based on discussions with many physicians and pathologists. Major R. W. Evans (personal communication), for example, examined 197 stools from consecutive diarrhoeal admissions in Normandy and isolated *B. dysenteriae* from 102 (Flexner 97, Sonne 4, Schmitz 1).

The supply of sulphonamides was lavish, and regimental medical officers had both sulphathiazole and sulphaguanidine, with instructions to treat all possible cases at unit level. Much man-power was thus saved. Of those admitted to hospital, and nearly always treated with sulphaguanidine, the average stay was about 7 days: this reflects the mildness of the infection, as my comparable Middle East figure was 17 days (Bulmer and Priest, 1943). No deaths occurred among Allied troops, but there were several among German prisoners of war treated by their own medical officers.

A condition which accounted for nearly one-third of medical admissions in Normandy, although relatively trivial and without fatalities, can hardly be dismissed after merely lauding its specific treatment. Can nothing be done to prevent it? Little has yet been accomplished except by the usual hygiene measures, which are of great importance and certainly reduce its incidence. In careful studies of isolated outbreaks in the U.K. many, if not most, have been traced to food-handlers who were carriers. It seemed to me justifiable to accept this mode of spread, and to recommend the periodic "sterilization" of food-handlers' stools by a week's course of sulphaguanidine. This was done in one key unit with good effects—a large-scale and controlled experiment was not practicable.

During the Normandy phase we were ignorant of the American work on chemoprophylaxis—the prevention of certain diseases by the continuous taking of sulphonamides: 1/2 to 1 g. of sulphathiazole daily during the dysentery season would be an interesting method with which to experiment under field conditions.

Typhoid Fever

In the autumn of 1944 an epidemic of typhoid fever affected 79 men from one small unit and one of the nursing sisters who attended them; the origin of the outbreak remains unsolved. It was, however, a serious one, as 11% died and complications and recrudescences were frequent. Jordan and Jones (1945) say of it: "Despite the fact that all the patients had been immunized against the enteric group of organisms the course of the disease was severe and unmodified." The efficacy of T.A.B. is not in dispute (our typhoid rate was 1/200 that of the B.E.F., 1914–18), but if patients are overwhelmed they will contract the disease, and apparently in an unmodified form.

Treatment remained expectant, but at a later date slight sensitivity of the typhoid bacillus to penicillin was demonstrated by Major R. W. Evans (unpublished), and several cases were treated very intensively with the drug without improvement in their condition.

Weil's Disease

A note has already been published on this subject (Bulmer, 1945). Buckland and Stuart (1945) re-examined our sera against further strains of leptospira, and found two which agglutinated *L. grippo-typhosa*—a form which is spread by Continental water-voles, and gives a brief brisk attack of Weil's disease without jaundice. Doubtless a number of our "short-term" fevers were due to this infection.

Diphtheria

Intelligence reports had warned us that diphtheria was endemic in Holland; we were apprehensive, as, apart from possible protection in childhood, neither British nor Canadian members of the Force had been immunized. When cases started to crop up it became evident that few medical officers had had much experience of diphtheria; owing to widespread immunization campaigns the disease had become much less common, and clinical opportunities during their student days had been limited. This applied even more to the Canadians, many of whom had never seen a case. They were soon to become very expert!

All medical officers were rapidly made "diphtheria-minded," and were asked to treat all suspicious sore throats at once on a clinical assessment. Very few cases were overlooked, and antitoxin was given very early. Naturally a great deal of it was given unnecessarily; but this did not matter—it was withholding antitoxin that we feared. The results were most creditable. My figures are liable to criticism, especially in the group called "clinical" diphtheria and not bacteriologically confirmed; nevertheless I was satisfied that the diagnostic error was not greater than 25%—many claimed it to be much less. I have notes of 3,000 cases and of 6 deaths—the figure for fatalities I know to be correct—this gives a case mortality of 0.2%.

The disease was on the whole mild, although there were a number of "gravis" infections and bull-necked types were not uncommon. Neurological complications were much less common than in the Middle East. We relaxed very considerably the strict nursing of diphtheria which is insisted upon in British fever hospitals: there were no ill effects, and the patients were much more comfortable.

Penicillin in Diphtheria.—This was used *as an adjunct* in the hypertoxic cases. Lieut.-Col. J. Bolton (personal communication) has some evidence to show that *C. diphtheriae* clears much more rapidly from the throat in penicillin-treated cases.

Convalescent Carriers.—If swabs were still positive on the 30th day the patients were transferred to a special wing of a hospital under Lieut.-Col. (now Brig.) R. E. Tunbridge, who had worked out a scheme of rehabilitation for these otherwise convalescent men. Tunbridge's studies (unpublished) on the effects of penicillin given locally in clearing carriers showed that it was not useful and that tonsillectomy remained the treatment of choice in the prolonged carrier.

Prevention.—Diphtheria is a dangerous disease; few victims are fit for duty under 6 to 8 weeks, and some are off for months with paralysis—the loss of man-power is therefore great. In future campaigns the problem need not arise if all troops are immunized on enlistment.

Typhus

The members of the Allied Forces had been protected against typhus by inoculation before D Day and had had a "booster" dose early in 1945; lousiness was uncommon, and D.D.T. was available as a dusting powder, and in solution for the impregnation of clothing. Typhus was known to be present in Germany among internees and forced-labour organizations, but it was not encountered in the mass until concentration camps such as Belsen and Sandbostel were uncovered: in them the Army medical services had to care for thousands of cases. There were some cases of typhus among released prisoners of war, and some of the British troops working in the concentration camps developed it; otherwise I am unaware of the occurrence of cases among military personnel. Protection and the anti-louse measures had proved most effective.

The disease as seen among internees was, on the whole, mild, and it was classical louse-borne typhus; the case mortality cannot be ascertained as many presumably died of starvation before the rash of typhus came out: in Belsen the case mortality from overt typhus was not high. After the internees had been deloused with D.D.T. there were very few secondary cases.

Effects of Inoculation.—In Belsen some British soldiers and some British medical students developed typhus; as they were all working in the filthy huts of the original camp, dust-borne spread seemed not only possible but likely. Among 21 such of whom I have notes there were no deaths—all had been inoculated. I have not complete notes of all the German personnel in Belsen who contracted typhus; of 25, many of whom I saw, 18 died—none had been inoculated. The series are not comparable, as there were differences in age, duties, diet, and living conditions. That typhus could kill the uninoculated is shown; that it did not kill the inoculated is satisfactory.

Starvation

Prisoners of War.—A number of cases of starvation were met with, as there had been a long period of under-nutrition, and often serious symptoms had been brought on by the forced marches from camp to camp as we advanced. There were few serious cases among British, Canadian, and United States troops, but very advanced emaciation was seen among other Allied troops, such as Russians and Poles. Our first problem was to try to get the newly released prisoner judiciously fed: serious, sometimes fatal, vomiting and diarrhoea had resulted from the mistaken kindness of their liberators. Full Army field service rations were ill tolerated; the secret of this early feeding is a soft, "pappy" diet. All prisoners fit to travel were flown back to the U.K.; those unfit were admitted to military hospitals in B.L.A. and rapidly improved on a simple gastric diet.

Civilian Problems.—Starvation was seen at its worst in civilians in Holland and in internees in Germany. I am unwilling to write on this subject, as it should be left to those who followed cases from day to day; it was unfortunate that the mass of material available for study by the R.A.M.C. was met with under conditions which made research and detailed scientific observations impossible, and it is doubtful whether anything but clinical observations will be published. I had many opportunities of observing the starving in Holland and in the German concentration camps (Belsen and Sandbostel) and camps for Russian prisoners of war—the sources of my information are too numerous to mention. I would make the following comments:

Clinical Features.—There were three types: wasting without oedema; oedema without wasting (rare); wasting with oedema. In Belsen, where starvation was acute and water scarce, *oedema* occurred in only about 6%; in Holland it seemed to be much commoner. Its cause is obscure, and there was little correlation with the level of plasma proteins. *Diarrhoea* was very common, and almost invariably present in the fatal cases; its cause, also, was obscure; dysentery bacilli were isolated in only about 15% of cases. We had assumed that it was dysenteric, and had provided large stocks of sulphonamides to treat it. Necropsy showed changes not unlike those seen in ulcerative colitis. Many cases were undoubtedly due to tuberculous enteritis. *Anaemia* was common: we had expected to find conditions resembling tropical nutritional anaemia, and had provided some liver extract, but investigation showed that both red cells and haemoglobin were equally reduced, and the blood picture suggested a simple marrow wasting. *Avitaminoses* of a clinically recognizable type were rare; perhaps they had been counteracted by the vegetarian diet—sometimes even raw grass was eaten—and by the use of potato peelings as a food. I saw two cases of pellagra at The Hague with Prof. J. Beattie, a few cases of polyneuritis, and a number of abnormal tongues, perhaps from lack of the B complex. Phrynodermia was common, but it may not be an avitaminosis. *Tuberculosis* was an alarmingly frequent sequel. *Gall-stone colic* was often seen, and gall-stones were found in most post-mortem examinations—possibly explained by dehydration.

Treatment.—General:—In mild cases a simple gastric diet suffices. In moderate and severe cases the best-tolerated foods were skimmed milk with glucose and the Bengal famine mixture (a gruel made with flour, sugar, salt, and water), and later the dietetic ladder was ascended. Three compound vitamin tablets were given daily. Casein

and protein hydrolysates had been prepared on a big scale, and controlled experiments were conducted in Holland under the direction of Prof. Beattie: they could be given orally, by nasal tube, or intravenously. In Belsen they were used on a small scale; but they were most nauseating by mouth. Patients had to be persuaded to take their drinks, and extensive nasal feeding was impracticable; their superiority over the simpler diets has not been established. *Oedema:*—This usually disappeared with a good diet. If it was very severe salyrgan intravenously was effective and seemed harmless. *Diarrhoea:*—As the cause was not clear, rational treatment was out of the question. The multiplicity of treatments found to be effective suggests that none was specific. *Intravenous Plasma:*—At Sandbostel Camp Capt. A. R. Blower carried out a most extensive experiment with plasma; he used 1,196 pints—an average of 5.1 pints per patient. His conclusions (personal communication) were that it had no effect on diarrhoea; it gave good results in severe wasting; and in oedema the results were inconclusive.

Penicillin

We had ample supplies of penicillin, and every opportunity was seized of studying its use in medical as opposed to surgical conditions. Owing to its non-toxicity and its action on a wide range of organisms, it would replace sulphonamides were its method of administration by repeated injection not so impracticable except in hospitals: the sulphonamides remained our sheet anchor in acute infections except from resistant organisms. Penicillin's greatest value to a fighting army was in reducing the time spent in hospital for simple ailments. The Adviser in Venereology (Lieut.-Col. D. J. Campbell) was able to reduce the time of treatment for gonorrhoea to 24 hours, and for syphilis to a little over a week if treated early in the primary stage. In simple pyodermias the Adviser in Dermatology (Lieut.-Col. F. F. Hellier) exploited its use to the full, even in minor medical units with the field force, and saved countless man-days. In ulcerative gingivitis its local application seemed to be specific, and the penicillin tablet should be the simple answer to this common ailment.

In the serious infections, where our object was to save life and not man-days in hospital, it proved invaluable in staphylococcal septicaemia and staphylococcal pneumonia. In pneumococcal pneumonia it was not better than sulphonamides. In meningococcal meningitis it proved to be curative if given intrathecally; but the many lumbar punctures needed make its use objectionable, and there is the danger of introducing resistant organisms into the theca. In Weil's disease it is of value in some strains if given very early. In acute diphtheria it is a useful adjunct to adequate antitoxin; and may clear the throat of bacilli more quickly than the average time taken.

Conclusion

I fear I have done scant justice to the team of British and Canadian physicians with whom it was my privilege to be associated; this is their work, and I have made myself their mouthpiece. They, working for the most part under improvised, difficult, and sometimes dangerous conditions, maintained a high standard of medicine, and a standard of acute medicine which I know I shall not again see. I regret that individual acknowledgment is possible only in a few instances.

The Canadian side, with its happy blend of British and American medicine, was always an inspiration, and I would thank Col. Murray Baird, R.C.A.M.C., their Consulting Physician, for his constant help. Finally, my thanks are due to the Director of Medical Services, 21 Army Group, Major-Gen. E. Phillips, for permission to publish this article, but more especially for his consistent support of, and constant sympathy with, the clinical side.

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E. C. Ross Couper (*Arch. Dis. Childh.*, 1945, **20**, 117), from a study of twenty cases of various infections in infants, concludes that penicillin has a useful part to play in parenteral infection in infancy, but much further investigation is needed.

ESTIMATION OF SERUM PROTEINS BY THE LINDERSTRÖM-LANG GRADIENT

BY

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The gradient method described by Jacobsen and Linderström-Lang (1940–1) affords a very quick and convenient means of measuring the specific gravity of serum and hence of estimating the concentration of protein in serum, as only the drop is needed. In this method a light and a heavy mixture of kerosene and bromobenzene are prepared. The lighter mixture is superposed on the heavier in a glass cylinder and the column of fluid is stirred. A zone is formed in which the specific gravity decreases with the height. The specific gravity of serum introduced into the column is estimated by comparison with the position taken up by drops of salt solution of known specific gravity. The apparent specific gravities found by this method differ from the true specific gravities, although the difference is less than that found in the copper sulphate method (Hoch and Marrack, 1945). This difference is reduced if chlorobenzene is used instead of bromobenzene.

Method

As the journals in which the preparation of this gradient is described are not available in all libraries, details of this preparation, with slight modification, are here given.

The Gradient.—Two mixtures of chlorobenzene (spec. grav. $S^{20}_{20}=1.109$) or bromobenzene (spec. grav. $S^{15^\circ}_{15^\circ}=1.499$) with kerosene (spec. grav. approximately 0.80) are prepared so that their specific gravities $S^{t^\circ}_{t^\circ}$ (t° = room temperature) are approximately equally spaced about the midpoint of the range required. The specific gravities of these mixtures should be approximately 0.04 above and 0.04 below that of the midpoint of the range of specific gravities required. For example, two mixtures prepared by mixing chlorobenzene and kerosene in the ratio of approximately 7.5 and 0.69 by volume had specific gravities ($S^{24^\circ}_{4^\circ}$) 1.064 and 0.982. At the midpoint of the gradient prepared with these mixtures the specific gravity $S^{24^\circ}_{4^\circ}$ was 1.023 and $S^{24^\circ}_{24^\circ}$ was 1.0257, corresponding to a concentration of protein in serum of 6.75 g. per 100 ml.

About 100 ml. of the heavier liquid is placed in a wide graduated cylinder (e.g., a 500-ml. measuring-cylinder which has been cut off at the 250-ml. mark) and the same amount of the lighter liquid is superposed by letting it run in slowly down a glass rod which touches the wall of the cylinder near the surface of the liquid. The two liquids are then mixed by moving a glass rod, bent at the lower end, up and down in the column with continued rotation until streaks (schlieren) appear at the bottom and top of the column. The gradient should then be tested with two drops of standard solutions, specific gravity 1.020 and 1.030. The distance between them should be 4 to 5 cm. The apparent specific gravity of a drop can be read with an accuracy of at least ± 0.0002.

As emphasized by Linderström-Lang (1938), saturation with water is essential. After the gradient is made up a set of 10 drops of the standard solutions should be left suspended in the column for at least a day before it is used. The cylinder should be kept in a water jacket in order to prevent rapid changes of temperature.

Standard Solutions.—The series of copper sulphate solutions with specific gravities differing by 0.001 prepared from a stock solution ($S^{24^\circ}_{24^\circ}=1.1000$; 159.6 g. in 1,000 ml. at 24° C.), as described by Phillips, van Slyke, *et al.* (1944, 1945), can be used. A series of drops covering the range of specific gravities anticipated is introduced into the column by the method described for serum. Fresh drops of the standard solution should be introduced if the old ones have been disturbed on removing a batch of drops of serum.

Procedure.—With a narrow pipette, attached to a rubber bulb, take up between 5 and 15 c.mm. of serum. Bring the point of the pipette about 3 mm. below the surface of the fluid in the cylinder. Blow the serum out gently so that it does not leave the point of the pipette until the pipette is withdrawn from the surface of the fluid. A slight positive pressure should be maintained throughout. Drops of 5 to 15 c.mm. are recommended instead of 1 c.mm. as used by Jacobsen and Linderström-Lang (1940–1), in order to increase the rate of fall and, in the case of serum, to delay solution of chlorobenzene or bromobenzene. Readings should be taken at the centres

of the drops, with precaution to avoid errors due to parallax. Every measurement is referred to the position of the nearest drops of standard solution by means of linear interpolation at the time of reading. Although the distances between two pairs of standard drops that differ in specific gravity by equal amounts may be found to be equal, it is possible that there may be occasional irregularities in the gradient; but the error in the estimate of specific gravity of the serum is not likely to exceed 0.0005. The level of the drops should be read 10 minutes after their introduction. This time was chosen because (*a*) it exceeds the time (2 minutes) required by drops of the standard solution to reach equilibrium to within a specific gravity of 0.0001, and (*b*) in this time the increase of specific gravity of the drop of serum, due to solution of chlorobenzene or bromobenzene, becomes so slow that no appreciable change in its level occurs while the reading is being taken. Estimations can be made on several sera before the drops are removed.

Removal of Drops.—Moisten a piece of filter-paper and wrap it round the lower end of a long thin glass rod. Bring this in contact with the drops, which will adhere to the paper. After removal of the drops the gradient should not be used again for 30 minutes.

Changes with Time.—The mixture gradually becomes uniform throughout; changes in two weeks may be appreciable.

Recovery of Reagents.—The chlorobenzene or bromobenzene can be separated from the kerosene, in a state fit for use in making a fresh gradient, by distillation at normal pressure. Unless the distillation is carried out under reduced pressure, part of the kerosene must be replaced by fresh material.

TABLE I.—*Comparison of Specific Gravities Measured by Direct Weighing and by the Chlorobenzene Gradient*

Case	Direct Weighing $S\frac{24°}{24°}$*	Gradient $S\frac{24°}{24°}$†	Difference: Gradient/Direct Weighing $S\frac{24°}{24°}$	Equivalent (g. protein/100 ml.)
1	1·0262₅	1·0264₀	0·0001₅	0·05
2	1·0266₅	1·0269₀	0·0002₅	0·09
3	1·0270₅	1·0273₅	0·0003₀	0·11
4	1·0270₀	1·0271₅	0·0001₅	0·05
5	1·0247₅	1·0249₀	0·0001₅	0·05
6	1·0245₀	1·0248₀	0·0003₀	0·11
7	1·0260₀	1·0261₀	0·0001₀	0·04
8	1·0263₀	1·0264₅	0·0001₅	0·05
9	1·0261₅	1·0264₀	0·0002₅	0·09
10	1·0250₀	1·0252₅	0·0002₅	0·09
11	1·0246₀	1·0251₀	0·0005₀‡	0·18
12	1·0255₅	1·0257₅	0·0002₀	0·07
13	1·0255₅	1·0259₀	0·0003₅	0·13
14	1·0244₅	1·0246₅	0·0002₀	0·07
15	1·0253₅	1·0256₅	0·0003₀	0·11
16	1·0248₀	1·0247₅	0·0000₅	0·00
17	1·0237₅	1·0238₅	0·0001₀	0·04
18	1·0266₅	1·0268₅	0·0002₀	0·07
19	1·0262₅	1·0263₅	0·0001₀	0·04
20	1·0275₀	1·0277₀	0·0002₀	0·07
Post-natal:				
81	1·0243₅	1·0245₀	0·0001₅	0·05
82	1·0267₅	1·0267₅	0·0000₀	0·00
Ante-natal:				
83	1·0254₀	1·0255₅	0·0001₅	0·05
84	1·0247₅	1·0249₅	0·0002₀	0·07
94	1·0255₅	1·0256₀	0·0000₅	0·02
95	1·0240₅	1·0240₀	−0·0000₅	−0·02
96	1·0266₀	1·0267₀	0·0001₀	0·04
97	1·0247₀	1·0249₀	0·0002₀	0·07
98	1·0257₅	1·0258₀	0·0000₅	0·02
		Average difference:	+0·0001	0·06

* Corrected to 24° C. by applying −0·00005 per °C.
† Measured between 19° and 22·5° C., uncorrected for temperature; the extreme correction would not exceed 0·00005.
‡ This large difference was probably caused by the error in the determination by direct weighing.

Effect of Temperature

One of the advantages of the copper sulphate and gradient methods, as compared with direct weighing and the falling-drop method, is that serum is compared with aqueous solutions whose coefficients of expansion differ little from those of sera. If the slight effect of temperature on the difference of solubilities of chlorobenzene in serum and copper sulphate solution is disregarded, the effect of temperature is the same as that in the copper sulphate method: the error in the calculated concentration of protein due to change of temperature up to 34° C. or down to 14° C. will not amount to more than 0.04 g. per 100 ml.

TABLE II.—*Comparison of Apparent Specific Gravities ($S\frac{24}{24}$) found by the Chlorobenzene and Bromobenzene Gradients*

Case	Readings after 10 Minutes			Readings after 60 Minutes		
	Chlorobenzene	Bromobenzene	Difference Br/Cl	Chlorobenzene	Bromobenzene	Difference Br/Cl
Malnutrition:						
21	1·0286₅	1·0289	0·0002₅	1·0287₅	1·0293₅	0·0006
22	1·0263	1·0266₅	0·0003₅	1·0264₅	1·0269₅	0·0005
23	1·0244₅	1·0247₅	0·0003	1·0247	1·0252₅	0·0005₅
24	1·0257	1·0261	0·0004	1·0260	1·0268	0·0008
25	1·0237₅	1·0241	0·0003₅	1·0240	1·0247	0·0007
26	1·0264	1·0265₅	0·0001₅	1·0265₅	1·0271	0·0005₅
Ante-natals:						
69	1·0255	1·0257₅	0·0002₅	1·0257	1·0261₅	0·0004₅
70	1·0264	1·0265	0·0001	1·0265₅	1·0267₅	0·0002
73	1·0249	1·0253	0·0004	1·0251₅	1·0258₅	0·0007
74	1·0270	1·0272₅	0·0002₅	1·0271	1·0277	0·0006
75	1·0264	1·0271	0·0007	1·0266	1·0272	0·0006
78	1·0289₅	1·0291₅	0·0002	1·0293	1·0296	0·0003
79	1·0274₅	1·0278	0·0003₅	1·0276	1·0281₅	0·0005₅
Post-natals:						
71	1·0257	1·0261	0·0004	1·0260	1·0262₅	0·0002₅
72	1·0266₅	1·0271	0·0004₅	1·0270	1·0274	0·0004
76	1·0273₅	1·0277	0·0003₅	1·0277	1·0282₅	0·0005₅
77	1·0263	1·0266	0·0003	1·0266	1·0270	0·0004
Cord blood:						
31	1·0289	1·0291	0·0002	1·0289	1·0292	0·0003
32	1·0257	1·0261	0·0004	1·0259	1·0263	0·0004
33	1·0253₅	1·0255₅	0·0002	1·0253₅	1·0255₅	0·0002
Diabetes:						
Bl	1·0245	1·0252	0·0007	1·0246₅	1·0257	0·0010₅
B	1·0264	1·0267	0·0003	1·0266	1·0269₅	0·0003₅
A	1·0274	1·0277₅	0·0003₅	1·0276	1·0281₅	0·0005₅
	Average difference .. 0·00035			Average difference .. 0·00052		
	Average protein equivalent, g./100 ml. .. 0·13			Average protein equivalent, g./100 ml. .. 0·19		

TABLE III.—*Number of Cases in which the Difference % between the Concentration of Protein calculated from the Observed Specific Gravity by Equations 2 and 3 and that calculated from the Nitrogen Content lay between Certain Limits. Values of K and A in Equation 1, calculated statistically*

Difference % of Values Calculated from Specific Gravity and Kjeldahl's	Chlorobenzene Gradient				Direct Weighing		
	Normals	Malnutrition	Ante-natals	Post-natals	Normals	Ante-natals	Post-natals
+5 to +5·9	—	—	—	1	—	—	—
+4 to +4·9	—	—	—	0	—	—	—
+3 to +3·9	—	4	—	4	1	—	2
+2 to +2·9	—	3	1	4	0	—	0
+1 to +1·9	2	2	3	4	3	—	5
+0·9 to −0·9	19	10	5	3	13	2	0
−1 to −1·9	4	4	4	3	2	2	1
−2 to −2·9	—	1	2	—	1	5	—
−3 to −3·9	—	1	5	—	—	3	—
−4 to −4·9	—	—	—	—	—	1	—
Greatest difference, negative side	−1·5	−3·4	−3·8	−1·9	−2·1	−4·1	−1·7
" " positive side	+1·9	+3·8	+2·6	+5·0	+3·0	−0·2	+3·7
Total number	25	25	20	19	20	13	8
Average difference in % of Kjeldahl	−0·16	+0·54	−1·1	+1·5	−0·05	·2·3	+1·6
Range of protein content (Kjeldahl)	6·16–7·44	5·27–7·81	6·27–7·99	6·24–7·54	6·16–7·39	6·22–7·38	6·24–8·48
K calculated statistically	359·2	353·3	364·6	348·0	358·5	—	—
A calculated statistically	1·0069	1·0067	1·0070	1·0066	1·0066	—	—
K calculated for A = 1·007	361·6	359·3	364·6	355·6	365·3	374	359

Effect of Solution of the Halogen-benzene in Serum

The apparent specific gravity of serum in the chlorobenzene gradient is higher than that found by weighing in a pyknometer (Table I), and the apparent specific gravity in the bromobenzene is higher than in the chlorobenzene gradient (Table II). These differences are apparently due to preferential solubility of the halogen-benzene in the serum. The solubility of bromobenzene in water is 0.045 g. per 100 ml.; the increase of the specific gravity of a drop of water owing to saturation with bromobenzene is about 0.0002. The halogen-benzenes are presumably much more soluble in serum than in water owing to the lipids in the serum. As the difference between the specific gravities of bromobenzene and serum is much greater than that between those of chlorobenzene and serum, a small excess in the amount dissolved in serum over that dissolved in the standard drops has a considerably greater effect in the case of the bromine compound. The specific gravities of the drops increase as the serum becomes saturated with the halogen compound; hence the differences between the specific gravities found in the bromobenzene and the chlorobenzene gradients are greater at 60 minutes after the drops are introduced than at 10 minutes. After the first 10 minutes the increase of specific gravity in the chlorobenzene gradient amounts to only 0.0002 in 50 minutes.

The difference in the solubility of the two compounds is illustrated by the behaviour of drops of different sizes in the two gradients. Within a short interval two pairs of drops of size about 50 c.mm. and 1 c.mm. were dropped into a chlorobenzene and a bromobenzene gradient. During the first 10 minutes in the bromobenzene gradient the small drop sank much below the level of the large drop; while in the chlorobenzene gradient the two drops were nearly level. After 6 hours the small and large drops were exactly level in both gradients.

Reproducibility and Accuracy

The readings obtained when two drops of the same serum were added to the same gradient in immediate succession were always identical. The specific gravities found using different gradients, or the same gradient at different temperatures, always agreed within 0.0004 and usually within 0.0002.

The concentrations of protein in serum calculated ($N \times 6.25$) from estimation of nitrogen by the Kjeldahl method were taken as the true concentrations. The values of K and A in Equation 1

$$P = K(S - A)$$

(where P is the concentration of protein in g. per 100 ml. and S the observed specific gravity), calculated statistically, are given in Table III. For convenience in calculation, in practice, the equations adopted were: Equation 2 for specific gravity found by direct weighing:

$$P = 365(S - 1.007)$$

and Equation 3 for apparent specific gravity found by the chlorobenzene gradient:

$$P = 361(S - 1.007).$$

The readings can also be made with fair accuracy 40 to 60 seconds after the introduction of the drop. If this is done the value of A should be 1.0069.

Using these equations, the agreement between the results obtained by direct weighing or the chlorobenzene gradient on the one hand and by the Kjeldahl method on the other is remarkable in the normal sera and satisfactory in others. As with the copper sulphate method, the average values found by specific gravity methods in sera from women during pregnancy and after delivery tended to differ in opposite directions from those found by the Kjeldahl method. This difference, which may be due to the higher concentration of lipids in the serum during pregnancy, is being studied further.

The "normal" sera were obtained from blood donors at the end of bleeding, after lying down for not less than 10 minutes; the concentrations of proteins found may therefore be abnormally low. The other subjects were bled with precaution to avoid stasis.

Since Table III was completed we have received a serum from a patient with extreme hypoproteinaemia, probably due to faulty nutrition. The concentrations of protein found were: Kjeldahl, 2.54 g./100 ml.; copper sulphate method (Equation 4, $P = 364(S - 1.006)$, Hoch and Marrack, 1945), 2.55 g./100 ml.; chlorobenzene gradient, 2.64 g./100 ml. The equations proposed therefore give satisfactory results when the concentration of protein in serum is very low.

[As this paper was going to press we received an article by Lowry and Hunter (*J. biol. Chem.*, 1945, **159**, 465) which gives a full description of the gradient method, using bromobenzene, with a discussion of its accuracy.]

Summary

The gradient method of Linderström-Lang is a convenient and rapid means of estimating the concentration of protein in serum.

The apparent specific gravities found by this method are higher than the true specific gravities. This difference is attributed to preferential solution of the halogen-benzene in the serum; it is less if chlorobenzene is used in the place of bromobenzene. Within moderate limits the effect of temperature is negligible.

Using chlorobenzene, satisfactory and consistent measurements of the concentration of protein are obtained.

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LIVER FUNCTION IN INFECTIVE HEPATITIS GAUGED BY HIPPURIC ACID SYNTHESIS TESTS*

BY

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Up till recently the hippuric acid synthesis test has been employed mainly as an indication of liver damage in isolated instances, particularly in the differential diagnosis of jaundice. In the present work the test has been used serially in an attempt to follow the course of liver damage in cases of infective hepatitis. Although there are many complications, both theoretical and practical, in the interpretation and analysis of the results of this test, it was decided that it was probably the most reliable of known guides to liver function, particularly in the presence of jaundice. Moreover, one of the more serious objections to the test—the wide "normal" range of figures obtained in healthy persons—does not apply when following liver function by serial tests in the same individuals.

Methods and Technique

Cases of infective hepatitis were admitted to hospital usually within three days of the appearance of jaundice. In most instances the serum bilirubin and hippuric acid synthesis were first estimated the next morning. The serum bilirubin was subsequently estimated (Malloy and Evelyn, 1937) twice weekly until the peak value was passed, and thereafter once a week until discharge; estimations were not always done on the same day as the hippuric acid test, and many of the values on which the accompanying Table is based have been obtained by interpolation between the nearest figures before and after the date of the test. The second hippuric acid test was performed usually just under a week after admission, and a third and final test was done a week to 10 days before discharge. The method used was the intravenous modification of Quick (1939), in which 1.77 g. of sodium benzoate was injected intravenously and the urine collected after one hour. The amount of hippuric acid thus excreted was estimated by the technique recommended by Weichselbaum and Probstein (1938), and expressed in terms of the quantity of sodium benzoate detoxicated. The present series includes 81 cases, 46% of which were admitted with rising serum bilirubin. Patients who developed relapses have been excluded.

Results

The results are recorded in the accompanying Table, which is so arranged that a direct comparison can be made between the hippuric acid results and the serum bilirubin concentration.

* A report to the Medical Research Council.

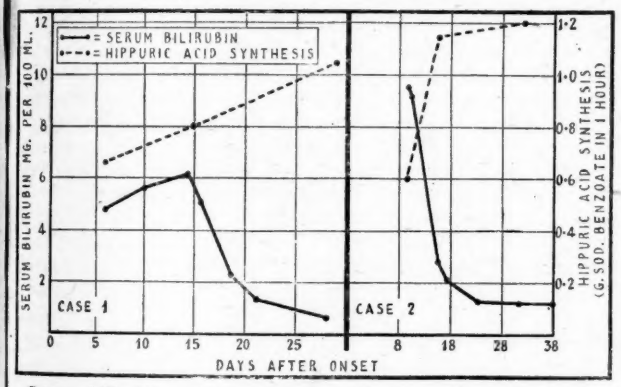
Cases have been divided into two main groups (A and B) according to whether they were admitted with rising or with falling serum bilirubin. These groups have been further subdivided arbitrarily into four roughly equal subgroups (1, 2, 3, and 4) according to the maximum recorded serum bilirubin values. The main points can be summarized thus:

(i) The hippuric acid synthesis (H.A) appears to reflect the severity of the attack and the stage of the disease rather than to be directly correlated with the serum bilirubin concentration. For instance, there is a significant difference (Difference/Standard Error=2.84) between the initial H.A. values in Subgroups 1 and 2, indicating a correlation between H.A. synthesis and severity of attack fairly early in the disease. There is also a significant difference (D./S.E.=2.33) between the initial H.A. values in Subgroups 1 and 3, although in this case the bilirubin concentrations are roughly equal; in Subgroup 1, however, the serum bilirubin is rising, and in Subgroup 3 falling; it is not surprising, therefore, that liver function in Subgroup 3 is better than in Subgroup 1. The difference applies only to the more severe cases, and is not apparent in Subgroups 2 and 4.

(ii) There is a considerable increase in H.A. values during the first 6 days in all groups. Even in Subgroup 1 the mean rise (0.126 ± 0.0125) is appreciable. The rise in Group B (0.325) is well over double the rise in Group A (0.139), consisting of cases admitted earlier in the disease, and the difference between the improvements in the two groups is highly significant (D./S.E.=3.91). It is of interest that this improvement in H.A. synthesis during the first week after admission occurs despite an increase in serum bilirubin. In Subgroup 1 it can be seen that there is a large mean rise of nearly 3 mg. per 100 ml. in serum bilirubin over the same period as the improvement in H.A. synthesis.

(iii) There is little difference between the groups in the mean H.A. synthesis before discharge. With the exception of Subgroup 1 this final test was performed, on an average, at the same interval after admission in all groups. Although Subgroup 1 is not strictly comparable with the other groups in this respect, there is no indication that the more severe attacks have produced any permanent liver dysfunction.

The course of H.A. synthesis and of serum bilirubin concentration in two patients are shown in the accompanying Chart,


= SERUM BILIRUBIN
= HIPPURIC ACID SYNTHESIS
SERUM BILIRUBIN MG. PER 100 ML.
HIPPURIC ACID SYNTHESIS (G. SOD. BENZOATE IN 1 HOUR)
CASE 1
CASE 2
DAYS AFTER ONSET

Serum bilirubin values and hippuric acid synthesis in two "typical" cases of infective hepatitis

as illustrating the types of case most often met with. They represent much the same picture as would be obtained from a study of the average figures recorded in the Table.

Possible Objections to Use of Test

(*a*) *Renal Damage.*—Although there is no reliable evidence to suggest that kidney damage occurs in any but the most severe cases of infective hepatitis, and Schwei and Quick (1942) have shown that damage to the kidney would have to be considerable before H.A. excretion became a limiting factor in the liver function test, it was thought advisable to test the renal function of a sample of cases in order to obtain first-hand evidence. Blood-urea concentrations and urea-clearance tests were therefore done on 12 unselected cases on admission. In all instances results were well within normal range. The mean blood urea was 26.4 (± 1.74) mg. per 100 ml., and the mean urea clearance was 159% of average normal, the lowest value being 97%. It does not appear likely, therefore, that renal damage, if it occurs at all, is sufficient to invalidate the use of the H.A. test in infective hepatitis.

(*b*) *Changing Protein Intake.*—It has been shown by Probstein and Londe (1942) that H.A. synthesis can often be increased by ingesting large quantities of glycine. Many patients in this series suffered from anorexia on admission, and in most cases their appetite, and therefore their intake of protein, increased during the first week in hospital. It was calculated that, on an average, the protein intake per day increased from 60 g. (on admission) to 120 g. (on discharge), and a large proportion of this increase probably occurred during the first week. It was therefore considered possible that at least part of the improvement in H.A. synthesis found to occur in most cases of infective hepatitis after admission to hospital might be a reflection of improvement in appetite rather than in liver function. It was accordingly decided to investigate the effect of a severe reduction in protein intake on H.A. synthesis. Twelve convalescent patients were tested shortly before discharge—i.e., at a time when liver function might be considered to be constant or at least not deteriorating—by performing H.A. tests immediately before and after four days of a diet containing no milk, meat, or eggs and very little bread. This entailed a protein reduction from at least 120 g. a day to between 20 and 30 g. a day. The mean H.A. synthesis dropped by 10% from 1.00 to 0.90—a difference of -0.10 (± 0.035). However, three patients actually showed a slight increase in H.A. synthesis after the diet. Since the conditions in this experiment are not and never could be really comparable with those pertaining to patients at the height of the disease, it is not possible to draw any hard-and-fast conclusion. The drop in protein intake of nearly 100 g. was possibly rather severe and certainly more than the average increase during the first week in hospital; and there is at present no means of knowing the relative effects of big changes in protein intake on H.A. synthesis of patients with different degrees of liver damage. It is not felt, therefore, that this difference in H.A. synthesis is great enough to invalidate the main conclusions based on our figures, although the results should, on this account, be treated with due reserve.

Discussion

These results show that in most cases there was a progressive improvement in liver function, as judged by the H.A. test, from the time of admission to hospital, although initially in nearly half of them the serum bilirubin concentration and jaundice were actually increasing. The H.A. synthesis was to a large

Mean Values of Serum Bilirubin and Hippuric Acid Synthesis during the Course of the Disease in 81 Cases of Infective Hepatitis

Serum Bilirubin Group	No. of Cases	On Admission		First Week after Admission			Before Discharge		
		H.A.	Serum Bilirubin (mg./100 ml.)	H.A.	Serum Bilirubin (mg./100 ml.)	Days after Admission	H.A.	Serum Bilirubin (mg./100 ml.)	Days after Admission
A. Rising on admission:									
(1) Maximum above 10 mg./100 ml.	14	0·527	9·50	0·653	12·45	6·0	1·048	1·61	38·8
(2) Maximum below 10 mg./100 ml.	23	0·689	4·64	0·850	5·22	5·5	1·060	1·10	27·2
Total	37	0·637	6·50	0·776	7·88	5·7	1·057	1·29	31·6
B. Falling on admission:									
(3) Admission value above 8 mg./100 ml.	17	0·678	10·25	0·993	3·86	6·7	1·155	1·05	28·3
(4) Admission value below 8 mg./100 ml.	27	0·683	4·61	1·008	1·83	6·3	1·081	0·75	27·0
Total	44	0·680	6·79	1·005	2·61	6·4	1·107	0·85	27·4

H.A. = Hippuric acid synthesis in terms of grammes of sodium benzoate.

extent correlated with the severity of the attack and the stage of the disease, but only partly, and indirectly, with the serum bilirubin concentration.

It is possible that the apparent dissociation of bilirubin excretory function and H.A. synthesis might be explained by the fact that bilirubin is being formed in the body at an approximately constant rate, and that the efficiency of the liver is therefore to be judged by the amount of bilirubin excreted each day rather than the concentration in the serum. In other words, so far as bilirubin excretion is concerned, liver function should be gauged by the rate of rise or fall of the serum concentration; it is then clear that even a rising serum bilirubin might be associated with an improving excretion, so long as the rate of rise was diminishing. This is of course an over-simplification of the problem, since it does not take into account the excretion of bilirubin into the urine. The main principle, however, still applies whatever complicating factor is introduced, and may be enough to account for the apparent dissociation of function referred to above—without, of course, being evidence against such dissociation occurring in other respects. It also, perhaps, contributes to an explanation for the oft-repeated but perplexing observation that, in infective hepatitis, the appearance of jaundice frequently coincides with clinical improvement.

The present work has shown that H.A. synthesis was already improving on the patient's admission to hospital, and the final conclusion which seems to be justified is that maximum liver damage occurs in most cases before admission. This is consistent with the finding previously reported (Pollock, 1945) that liver damage is present in the pre-icteric stage some time before the serum bilirubin rises above normal and often several days before the onset of jaundice.

The practical application of this conclusion is that in order to demonstrate satisfactorily the effect of specific treatment in the average case it is preferable that it be started before the liver has begun to improve spontaneously—in effect this means before jaundice appears. Every effort was made to arrange for admission of our patients to hospital as soon as possible after the onset of symptoms; but, even so, only three were admitted in the pre-icteric stage, and it is unlikely that speedier admission will be achieved until there is some outstanding improvement in methods of early diagnosis. The problem of treatment of infective hepatitis depends, more than in most diseases, upon accurate diagnosis in the initial stages.

Summary

The course of liver damage in 81 cases of infective hepatitis has been followed by the use of serial hippuric acid synthesis tests.

The ability to synthesize hippuric acid bore some relation to the severity of the attack and to the stage of the disease, but was only indirectly related to the serum bilirubin level.

In most cases there was progressive improvement in hippuric acid synthesis from the time of admission to hospital, even though it was often associated with a rising serum bilirubin and increasing jaundice.

It is probable that maximum liver damage in this disease most commonly occurs before the patient is admitted to hospital. Specific treatment is therefore not likely to have any striking success unless begun in the pre-icteric stage.

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Sir John Fraser, presiding at a meeting of the technical committee of the Scottish Blood Transfusion Association, reported that in the quarter ended Sept. 30 last the demands of the hospitals for blood and plasma had, for the first time, exceeded the supply of blood obtained from donors. Fortunately, Sir John said, the regional services had sufficient reserves to meet this contingency. There had been a falling off in donor attendances since the end of hostilities—a fact which gave rise to some concern in view of the continuing and increasing demands of the hospitals, particularly the maternity hospitals. During the quarter 6,986 bottles of blood were obtained from donors, as against 11,946 in the preceding quarter; and, but for reserve stocks, this would have been insufficient to meet the 3,934 bottles of blood and 2,937 bottles of plasma supplied to or reserved for the hospitals. An increase in the use of plasma by hospitals was reported at the meeting—a circumstance emphasizing the great need for new blood donors.

MANAGEMENT OF RECENT FRACTURE-DISLOCATIONS OF THE CERVICAL SPINE

BY

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The treatment of fracture-dislocations of the cervical spine by continuous skull traction (Crutchfield, 1933) is well enough established for a detailed discussion of its justification and indications to be unnecessary (but see Key and Conwell, 1937). Descriptions, however, of the practical details of the method vary considerably. The present communication is an attempt to combine various suggestions into a scheme of treatment which, so far as is possible, shall be simple, efficient, and comfortable to the patient.

Application of Traction

Reduction of a fracture-dislocation of the cervical spine involves both traction and extension (Watson-Jones, 1943). These can be achieved simultaneously by an upward pull applied to the skull on a plane anterior to the atlanto-occipital joint. The anterior longitudinal ligament of the spine is thus tautened, and extension of the cervical intervertebral joints follows. This effect has been secured by traction on the zygomatic processes, but that has the disadvantage that extension of the head tends to proceed until the skin of the front of the neck is taut. In this position swallowing is difficult enough for the normal individual; when further impeded by dysphagia of medullary origin or by a large retropharyngeal haematoma it becomes impossible. On the other hand, if the calliper is placed directly above the pinna—i.e., vertically above the atlanto-occipital joint (as recommended by McKenzie, 1935; Barton, 1938; Watson-Jones, 1943)—the force causes traction alone without extension.

Hoen (1936) proposed to place the point of traction slightly more anteriorly, which is mechanically sound. He preferred to use 18- or 20-gauge stainless-steel wire, sinking two pairs of burr-holes in the skull near the midline and running wire through the extradural space between them. This method leaves the sides of the patient's head clear of projecting apparatus and therefore allows him to be turned more easily; the only objection is that the intervening bridge of skull has been known to break during the period of traction. In the series of cases on which this paper is based callipers or steel wire were used as they happened to be available.

Counter-traction

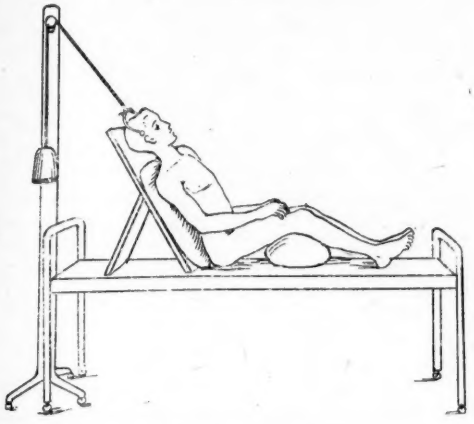
Counter-traction is made by the friction of the patient's body against the mattress on which he lies, and a gravitational component may be added by raising the head of the bed. This latter also reduces the thrust of the abdominal viscera on the patient's diaphragm and his liability to pulmonary congestion and pneumonia. When abdominal distension is severe, as is not uncommon, raising the head of the bed even as much as two feet may not suffice to prevent respiratory distress. McKenzie (1935) illustrates a case of fracture-dislocation, evidently not complicated by spinal cord damage, which was nursed in the sitting position. In this position the upward thrust of the abdominal viscera is minimal and the patient can look round at others in the ward or read without recourse to mirrors or special apparatus. Further, his head is in the most natural position for the act of swallowing. I found that McKenzie's method can equally well be applied to cases with cord lesions.

Management of the Case

In the method here described the point of application of traction is kept slightly anterior to the pinna so as to maintain extension, and the patient is nursed in the sitting position. The apparatus required has been simplified to the degree demanded by Service conditions. The bed is prepared as follows:

A stout post is lashed to the middle of the upper end and a wooden back-rest is laid at an angle of 60° on its upper half. Attach to

the post a pulley at such a height that traction can be made approximately along the line of the rest. Have ready not less than 30 lb. of weights and plenty of sash-cord. I have not had to use more than 30 lb. in reducing any fracture-dislocation seen within the first three days. In a case a couple of weeks old 60 lb. has been



required. Now lower the back-rest and cover enough of it with pillows to support the patient's trunk, but not his head or neck. An air ring is desirable for the buttocks and a "donkey" at knee level. On admission to the ward before reduction the patient is lifted supine on to the bed; his head and neck, being clear of the pillows, will be maintained in a position of extension.

The head-tractor can be applied without further movement. If callipers are used, burr-holes should be made in the skull, under local analgesia, at a point not more than one inch anterior to the external auditory meatus and slightly above the temporal crest. Traction so applied will not over-extend the head. When the tractor is in position the surgeon steadies it while assistants raise the back-rest to an angle of about 60° with the bed. At first 18 lb. of traction is applied (see diagram).

A portable *x*-ray apparatus is now brought to the bedside. If in half an hour 18 lb. has produced no radiological change, the weight should be increased by 4 lb. and the increase repeated as often as necessary. Once the reduction begins it often progresses to completion within a matter of minutes rather than hours, and when it is complete the tractive weight can be reduced to 8–12 lb. without fear of redisplacement. If further extension of the spine seems necessary it can be provided by putting additional pillows under the patient's back. At this stage, too, it is desirable to see that the patient is reasonably comfortable and can swallow. If not, a slight reduction in the weight may help. The final radiograph should be taken not sooner than 30 minutes after heavy traction has been discontinued.

Traction at the 8–12 lb. level must continue for at least three weeks, during which it is desirable to check the position of the fracture radiologically every few days. After that time the weight can usually be gradually reduced, and in a further week or ten days, if the reduction is radiologically stable, a Minerva plaster jacket can be applied and the patient allowed up, provided no complicating spinal cord lesion is present.

Nursing care during the period of traction is not more difficult than after a major abdominal operation. Although the patient cannot, of course, be turned completely on his side, sufficient changes in his position to prevent the development of pressure sores are readily made. If they should occur, which in my series they did not, the patient could at once be restored to the horizontal position and nursed on his sides for a time. There should be a constant thickness of pillows behind the back, for on the whole the less the cervical spine is extended, the heavier the traction that must be applied to it in order to maintain reduction of the fracture.

In cases presenting complete spinal cord lesions on admission the early mortality rate is very high, and when a complete lesion shows no sign of recovery within fourteen days it can be assumed to be permanent. Once this is established the nursing care of the patient and his comfort are all that need be considered; the fracture is unimportant. However, the method described here has been continued after this time because it provided a maximum of comfort.

Results and Discussion

The series of cases treated by this method is small—seven in all. Four others have been treated by the same method in Prof. Geoffrey Jefferson's neurosurgical service at the Manchester Royal Infirmary. Deaths numbered four—all in cases of complete cord lesions. Such deaths may be regarded as inevitable. The other cases gave no cause for anxiety at any time, and no difficulty was experienced in maintaining a satisfactory reduction of their fracture-dislocations. In two cases with partial cord lesions which developed severe abdominal distension the benefits of the sitting position were apparent from their comparative comfort. Respiratory embarrassment (of which I have seen several distressing examples in cases nursed flat, even with the head of the bed amply raised) was not a feature. In the patients who died from ascending haematomyelia with medullary failure there was never any appearance of "fighting for breath"; respiration appeared adequate until the cardiovascular centres were already grossly affected. Artificial respiration by mechanical means must occasionally find a place in treatment, though when it is still necessary after reduction the patient is unlikely to survive for more than a few hours. But if the lesion is from the beginning compatible with life the patient needs only the optimum conditions for respiration and he will not die of a pulmonary complication. These conditions, together with other advantages, may be derived from treatment in a sitting position.

Summary

Some advantages and disadvantages of the method of treatment of fracture-dislocations of the cervical spine by continuous skull traction are considered, and the theoretical basis of the treatment is discussed.

It is suggested that it is an advantage to nurse the patient in a sitting position. Practical details are given and the experiences of a small series of cases mentioned.

My thanks are due to Lieut.-Col. L. S. C. Roche, *M.C.*, R.A.M.C., commanding a military hospital for head injuries, for permission to publish this paper, and to Prof. Jefferson for permission to mention the cases treated in his service.

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THE THERAPEUTIC EFFICIENCY OF ULTRA-VIOLET-LIGHT APPARATUS

A COMPARISON OF TESTS

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The present investigation, undertaken at the direction of the Director-General of Medical Services, Royal Air Force, set out to determine the relative accuracy of commercial methods of measuring the therapeutic output of ultra-violet-light apparatus, as compared with laboratory techniques. Ultra-violet-light apparatus is widely used throughout the Royal Air Force, both for the treatment of pathological conditions and for its general tonic value—as, for example, in the case of aircrews engaged on night operations. It was therefore considered essential to ensure that the means used for testing the therapeutic activity of the output of U.V.L. apparatus were accurate within clinical limits.

Spectral Requirements for Ultra-violet-light Therapy

First it may be desirable to review briefly the nature of the frequency spectrum produced by commercial U.V.L. apparatus, and the spectral requirements for U.V.L. therapy. The spectrum of the mercury atom has a number of emission lines of radiation between 10,140 A.U. and 1,849 A.U. The longest of these (10,140 A.U.) falls in the infra-red range; others (5,790 A.U. to 4,050 A.U.) are visible, while a powerful group occurs in the "near ultra-violet" around 3,650 A.U. In

the mid and far ultra-violet, strong mercury lines are found at 3,130, 2,967, 2,537, and 1,849 A.U. The relative intensities of these wave-lengths, and others less powerful, as emitted by a particular type of mercury-vapour-lamp, are a function of its design.

It is generally accepted (Laurens, 1933 ; Blum, 1944 ; Osborne and Holmquest, 1944b) that the therapeutic action of U.V.L. is dependent chiefly upon radiation of wave-lengths less than 3,200 A.U. ; for example, the mercury line at 2,967 A.U. has antirachitic properties (Forsythe and Adams, 1944a), while that at 2,537 A.U. is highly bactericidal (Forsythe and Adams, 1944a ; Osborne and Holmquest, 1944a). The chief value of the longer 3,650 A.U. group is in the diagnosis of fungous infections by fluorescence.

From the foregoing it is seen that a substantial proportion of the energy emitted by a mercury-vapour lamp has little therapeutic action, and the importance of distinguishing between active and relatively inactive radiation becomes apparent.

Methods of Measurement

Apart from laboratory techniques, two practical methods of detection and measurement of therapeutic ultra-violet radiation present themselves. These employ respectively the barrier-layer photovoltaic cell and the vacuum or gas-filled photo-emissive cell. The former develops a small voltage, while the latter emits electrons and becomes conductive, when subjected to radiation. Accordingly the indicating instrument used with the photovoltaic cell takes the form of a sensitive low-resistance microammeter connected directly across the cell ; the photo-emissive cell, on the other hand, requires a source of direct voltage for its operation. It is customary to use a load resistance in series with the photo-emissive cell and its source of supply ; variations in potential across this load are applied to the input of a suitable D.C. amplifier, in whose output circuit the indicating instrument (milliammeter) is connected.

The response of barrier-layer cells and photo-emissive cells varies widely with the wave-length of the incident radiation and the composition of the sensitive surface ; it is therefore necessary to choose a cell having a suitable spectral characteristic for the measurements involved. The copper-oxide barrier-layer cell has a spectral sensitivity very different from that of the eye (Bowen, 1942b), and is therefore unsuitable for direct measurement of ultra-violet radiation. It can, however, be so used in conjunction with a suitable fluorescent screen, which converts the incident ultra-violet radiation to a longer wave-length within the range of sensitivity of the cell (Bowen, 1942d). Cadmium or sodium photo-emissive cells, on the other hand, have suitable characteristics for direct measurement of ultra-violet radiation. Of these types, the cadmium cell, having optimum sensitivity between 2,500 A.U. and 3,000 A.U. (Bowen, 1942c), is the better suited for measurement of therapeutic activity ; it must of course be provided with a quartz window, since glass is opaque to wave-lengths of this order.

Description of Apparatus Examined

Three practical methods of measurement were compared against a standard kindly lent for the purpose by Mr. E. J. Bowen, F.R.S., of the Physical Chemistry Laboratory, University of Oxford. These were : (i) Weston double photovoltaic U.V.L. meter ; (ii) Weston single photovoltaic cell U.V.L. meter ; (iii) E.M.R.U. cadmium photo-emissive cell meter.

The standard apparatus used was a Jeffree spectrophotometer ; this comprises a monochromator, a sodium cell, and an electrometer. Two drums calibrated in wave-length (range 2,200 A.U. to 6,000 A.U.) control the position and width of the monochromator slit, thus passing any desired line or band of wave-lengths within the stated range. A quartz-windowed sodium photo-emissive cell is connected in circuit with a quadrant electrometer and a suitable source of H.T. (about 160 volts) ; a variable resistance of 50,000 ohms permits adjustment of the electrometer to zero. The electrometer scale and needle are illuminated by an internal lamp and viewed through a microscope eyepiece. A switch is provided which short-circuits the input to the electrometer ; the latter is adjusted to zero with the switch closed. To make a measurement the radiant source is placed at a suitable known distance from the receiving-plane of the instrument, the wave-length drums are adjusted to the desired band, and simultaneously a stop-watch is started. The watch is stopped when the electrometer needle has moved a convenient number of divisions. The electrometer is so calibrated that its scale-reading represents the number of gramme-molecular quanta of radiation per square centimetre received during the time period measured by the stop-watch ; hence to compute gramme-molecular quanta per sq. cm. per second the scale-reading is divided by time in seconds. A simple calculation converts gramme-molecular quanta to microwatts.

(i) The Weston double-cell meter was lent by Messrs. Hanovia, Ltd., and is understood to be the standard used in their works laboratory. It comprises two photovoltaic cells and a microammeter ; the cells are connected in opposition through a balancing control in such a manner that the potentials generated by them may be balanced until the meter reads zero. A switch provides two ranges of sensitivity. One cell is furnished with a fluorescent screen whose function is to convert ultra-violet radiation into visible light of longer wave-length, to which the cell is sensitive. A detachable clear-glass filter, transmitting visible light but cutting off the shorter ultra-violet wave-lengths, is also provided. In use, both cells are first screened by the glass filter, and the meter is adjusted to zero by means of the balancing control. Thus all radiation (visible and long U.V.) transmitted by the filter is effectively cancelled out. The filter is then removed ; one cell, being unresponsive to U.V., will be unaffected, while fluorescence of the screen of the second cell will increase its output, deflecting the meter. A calibration chart is provided, which relates scale-reading with incident energy in microwatts per sq. cm.

(ii) The Weston single-cell meter was also lent by Messrs. Hanovia, and is the pattern carried by their service engineers for checking the efficiency of ultra-violet lamps at the user's premises. It comprises a single photovoltaic cell and microammeter ; in appearance it resembles the well-known Weston photo-electric photographic exposure-meter. The cell is screened by a dark-purple filter, opaque to visible light, which presumably is backed by a fluorescent screen ; it was not possible to investigate this in detail, since it would have entailed dismantling the instrument, which was not permissible in the circumstances of the loan. A calibration chart is provided which claims to relate scale-reading with minimum perceptible erythema time, while other charts indicate the scale-reading to be expected from various types of commercial ultra-violet-light sources when fully efficient.

(iii) The cadmium-cell apparatus was developed by the Electro-Medical Research Unit, Royal Air Force. It comprises an Osram quartz-windowed cadmium photo-emissive cell, type U.D.G. 7, having maximum spectral sensitivity in the 2,500-3,000 A.U. range ; it is insensitive to visible and long ultra-violet radiation. This type of cell was selected on the recommendation of Mr. Bowen as most suitable for measuring the important therapeutic wave-lengths. Its output is fed to a single-stage direct-coupled amplifier, in whose output circuit an indicating milliammeter is bridge-connected ; a balancing control is provided for zero adjustment. The whole is operated from A.C. supply mains via a self-contained power pack providing rectified, smoothed, and voltage-stabilized H.T.

Test Results

Throughout the following tests the supply voltage was maintained constant at 230 volts, A.C. 50 c/s.

Weston Double-cell Instrument.—This instrument was compared with the Jeffree standard. A quartz mercury-vapour arc tube was used as source, and comparative measurements were made, first with the bare source, then through filters isolating 3,340–2,895 A.U. and 2,650–2,537 A.U. (Bowen, 1942e). Throughout, the Jeffree standard was adjusted to cut off wave-lengths above 3,200 A.U. The agreement found, when both series of measurements were reduced to microwatts per sq. cm., was reasonably close ; it was concluded that the absolute calibration of this instrument was satisfactory, and, of far greater importance, its response to radiation longer than 3,200 A.U. was small. Such a double-cell metre may therefore be regarded as providing an entirely satisfactory means of measuring the therapeutic content of the radiation from ultra-violet sources.

Weston Single-cell Instrument.—An initial test was made by Mr. Bowen at the Physical Chemistry Laboratory, Oxford. The instrument was placed in the full light of a quartz mercury-vapour arc tube, at such a distance as to produce a scale-reading of 50°. A clear glass plate, cutting off the shorter U.V. wave-lengths, was

then interposed; the reading fell to 35°. Since the built-in dark-purple filter transmits little visible light, the residual reading of 35° must be chiefly due to the powerful but relatively inactive 3,650 A.U. line. It is known that short-wave production by a quartz mercury-vapour arc tube deteriorates more rapidly with use than long-wave production, hence a measurement which includes a large proportion of 3,650 A.U. radiation may give a misleading impression of the extent to which deterioration has occurred.

At Mr. Bowen's suggestion tests were carried out with a small series of new and deteriorated tubes; comparative measurements were made with the Jeffree and Weston instruments, the Jeffree instrument being adjusted to accept all radiation between 3,200 and 2,200 A.U. The deteriorated tubes were lent by Messrs. Hanovia, and were stated to show signs of 600–800 hours' use.

For simplicity in comparison, the indications of the Jeffree instrument were reduced to a "figure of merit" for each tube; the time required to produce a given deflection of the Jeffree electrometer is inversely proportional to the intensity of the incident flux, hence the reciprocal of the time is proportional to the intensity. The figure of merit shown in Table I was calculated on this basis, and was finally so adjusted (by multiplying by a constant) that a new arc tube chosen at random is rated at 10.5, corresponding to the indication of the Weston instrument.

TABLE I

	New Tube	Old Tubes			
		A	B	C	D
Jeffree	10·5	4·0	4·2	4·0	4·0
Weston	10·5	5·5	5·0	6·0	5·0
Discrepancy, % ..	—	+37	+19	+50	+25

These figures tend to confirm the view that the single-cell Weston instrument responds to wave-lengths over 3,200 A.U., since the meter indication falls off less rapidly than the 3,200–2,200 A.U. incident flux intensity. This is further borne out by the calibration figures provided with the instrument, which connect scale-reading with M.P.E. time; the inverse relation is non-linear, the M.P.E. time increasing more rapidly than the scale-reading diminishes. Allowance must therefore be made for this factor in interpreting the indications of the instrument.

E.M.R.U. Photometer.—A series of measurements similar to those described under (ii) above were carried out with the E.M.R.U. cadmium-cell photometer. The results are given in Table II; for ready comparison the Jeffree "figure of merit" has been adjusted to agree with the E.M.R.U. meter indication in the case of the new tube.

TABLE II

	New Tube	Old Tubes			
		A	B	C	D
Jeffree	12·5	4·8	5·0	4·8	4·8
E.M.R.U.	12·5	4·5	5·5	5·0	5·0
Discrepancy, % ..	—	−6	+10	+4	+4

It will be seen that the agreement is close, confirming the value of the cadmium cell for the measurement of the therapeutic band of ultra-violet wave-lengths.

Conclusions

The Weston double-cell photometer provides an entirely satisfactory means of measuring therapeutic ultra-violet light, and is extremely portable.

The Weston single-cell photometer has the advantage of lower cost, but responds to some extent to non-therapeutic wave-lengths.

The E.M.R.U. cadmium-cell instrument provides a satisfactory alternative to the Weston double-cell photometer where extreme portability is less important.

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ANTI-M ISO-AGGLUTININS IN HUMAN SERUM

BY

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The blood-group agglutinogens M and N were discovered in 1927 by Landsteiner and Levine, using rabbit immune sera. In contrast to the agglutinogens A and B, with their naturally occurring agglutinins α and β, no anti-M or anti-N antibodies are normally present in human sera. Further, the M and N agglutinogens are practically devoid of antigenic properties in man, and thus, as the transfusion of blood containing M or N does not give rise to iso-immunization against either factor, M and N can be disregarded in choosing blood for transfusion. To date only two instances of immune anti-M agglutinins have been recorded in human sera (Wiener and Forer, 1941; Wiener, 1942). In addition to these two examples Wiener (1943) cites five other instances of anti-M agglutinins in human sera, all of which are presumed to be of natural occurrence and not of immune origin. A single example of anti-N agglutinins in human serum was described by Singer (1943), but this case was not well substantiated.

In view of the rare occurrence of anti-M agglutinins—only seven out of hundreds of thousands of human sera tested by workers all over the world—it seems worth while putting on record the finding of another example. The serum in which this irregular agglutinin was found was detected during a serological examination of 60 patients who had suffered from a degree of toxaemia in pregnancy severe enough to require admission to hospital. For each patient the ABO blood group, MN type, and Rh factor were determined, and the serum was inactivated for half an hour at 55° C. and tested by titration against a panel of Group O cells of various M, N, and Rh types at 37° C., room temperature, and 4° C. A control of the patient's own cells was included.

The patient, Mrs. J. B., belonged to Group O Type N, Rh-negative (rr). When it was shown that her serum contained an irregular antibody she was asked to report back to hospital and bring as many members of her family as possible so that a further sample of blood could be obtained from her and the cells of her children and husband tested. Unfortunately the husband and first child were not available. The obstetric history and blood groups tested are as follows: (1) 1931, full-time, male, normal; (2) 1936, full-time, male, normal. Group O, MN, Rh-positive (R_1r); (3) 1938, premature, neonatal death; (4) 1940, full-time, female, normal, Group O, N, Rh-positive (R_1r). Mrs. J. B. has never received a blood transfusion.

Serological Examination

When freshly withdrawn the serum gave no reaction with any of the cells at 37° C. At 4° C. it agglutinated all the cells, including the patient's own, apparently from the action of a non-specific cold agglutinin. When the cell–serum mixtures were allowed to warm from 4° C. to room temperature it was noted that agglutination disappeared from the tubes containing the patient's own cells and those which lacked agglutinogen M, whereas all the cells containing M substance remained clumped. Accordingly the non-specific agglutinin was removed from the serum by absorption in the cold, leaving the whole blood overnight at 4° C. and next day separating the serum in the cold. Thereafter the serum gave specific reactions with cells containing agglutinogen M, irrespective of their Rh type, the results corresponding with those given by several anti-M rabbit immune sera. The titre of the treated serum against MM and MN cells was 1/16 at 4° C. and 1/4 at room temperature. It failed to react with the fourth child's cells, and in an extended investigation did not agglutinate any Rh-positive cells of type N—i.e., anti-Rh agglutinating antibodies were absent. These findings were confirmed by Dr. Race at the Galton Laboratory, Cambridge, to whom samples of blood were submitted.

Tests for incomplete or blocking anti-Rh antibodies were also entirely negative.

Comment

The finding of an irregular iso-agglutinin in the serum of an Rh-negative individual tempts one to consider that it may have

originated through iso-immunization in pregnancy, since it is known that it could not have arisen as a result of blood transfusion. This possibility is strengthened by the occurrence of a neonatal death (third pregnancy), although there is no proof that this was due to haemolytic disease caused by the action of the irregular agglutinins (anti-M) in the maternal serum. In relation to this possible explanation it is noteworthy that the next child's cells do not contain agglutinogen M and are therefore compatible with the maternal serum; this would account for the absence of haemolytic disease in the fourth child even in the presence of maternal iso-immunization to agglutinogen M. It is difficult to suppose, however, that if iso-immunization to M substance had arisen in a Type N Rh-negative woman from a pregnancy in which the foetus carried both M and Rh factors there would not have been simultaneous production of anti-Rh. In Wiener and Forer's case (1941) of iso-immunization by transfusion the Rh-negative Type N individual developed both anti-Rh and anti-M agglutinins. The frequency of anti-Rh antibodies arising from pregnancy or transfusion as compared with the rarity of anti-M agglutinins indicates that the Rh factor is usually a better antigen in man than the M substance. Since the children and mother all belong to Group O the antigenic qualities of Rh have the optimum conditions in which to exercise their effect, for it is recognized that iso-immunization to the Rh factor is more frequent when the pregnancy is homo-specific for ABO groups than when it is hetero-specific (Race, Taylor, Cappell, and McFarlane, 1943; Plaut, Barrow, and Abbott, 1945; Wiener, 1945). The fact that the fourth child, who is Rh-positive, did not suffer from haemolytic disease practically excludes maternal iso-immunization to the Rh factor as the cause of the loss of the third child, because once haemolytic disease has affected an Rh-positive child of an Rh-negative mother no subsequent Rh-positive child escapes haemolytic damage. If, therefore, iso-immunization to the Rh factor has failed to occur it is reasonably certain that the irregular anti-M agglutinin in this patient's serum is of natural rather than iso-immune origin.

Summary

A case is reported of anti-M agglutinins in the serum of an Rh-negative patient, and reasons are advanced for regarding it as of natural occurrence.

The work described in this paper was carried out under the supervision of Prof. D. F. Cappell, then Director of the East of Scotland Blood Transfusion Service, and I would like to thank him for his interest and criticism.

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Medical Memoranda

Treatment of Chilblains by Paravertebral Sympathetic Block

In an article by Morris (1942) on the treatment of thrombophlebitis by paravertebral sympathetic block it was suggested that the condition is alleviated by the reduction of arterial and venous spasm, particularly the former.

Having a number of cases of severe chilblains which had resisted the usual forms of treatment, such as the administration of calcium orally and intramuscularly, I wondered whether a paravertebral block might not relieve and even cure the symptoms. On theoretical grounds it seems probable that in cases of defective circulation in the limbs the cold atmospheric conditions give rise to arterial and venous spasm. The spasm results in suboxygenation of the tissues, which of itself gives rise to further vascular spasm. This vicious circle is broken by the sympathetic block, and the circulation is restored to normal. Once having been restored it remains normal for a considerable period. Again on theoretical grounds, it would seem likely that the relief of the spasm by a short-acting local analgesic should not outlast the duration of analgesia, but in the following series this has not proved to be the case.

METHOD

The technique used is a slight modification of that summarized in M.R.C. War Memorandum No. 13 (1944). The analgesic employed has been amethocaine 1/1000 plus adrenaline, the effect of which lasts about two and a half hours. An hour before the injection the patient is given a hypodermic injection of morphine gr. 1/4 or 1/6. With the patient sitting, a 10-cm. needle is inserted four fingerbreadths from the midline at an angle of 40° to the sagittal plane at the level of the interval between the second and third lumbar spinous processes. It is pushed forwards and medially until it strikes the lateral aspect of the vertebral body. It is then withdrawn a little and re-inserted until it comes to rest in contact with the antero-lateral aspect of the vertebral body. It is pushed forward a further 1 cm. The stylet is withdrawn to make sure that the needle has not perforated a vessel. 20 c.cm. of the amethocaine–adrenaline solution is injected, and almost immediately there is a feeling of warmth in the ipsilateral lower limb. This feeling persists for the period during which the analgesic is effective. I have not yet attempted to use alcohol—first, because of fear of inaccurate placing of the solution; and, secondly, because it has not been necessary.

Of the eight cases treated six have proved to be cured throughout the whole of the winter months. The two most interesting cases were those of women, both of whom were deputizing for their husbands in butchers' shops as a war measure. After one injection these women were able to return to work in the shop with no discomfort, although cold and snowy weather persisted on and off for several weeks afterwards. Another patient was very neurotic and was unable to sit still while the injection was given. One woman recorded a certain degree of analgesia of both legs, obviously due to inaccurate placing of the solution; but it passed off after two hours, and a lasting relief of her chilblains followed.

The technique of the injection is not difficult to acquire after a little practice, and the results are so good for such a long period that it is well worth the time required to perfect it.

My experience suggests that there is a field for further investigation, not only in the treatment of chilblains but in other conditions where defective circulation appears to be due to vascular spasm.

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Acute Haemolytic Anaemia due to Sulphonamide Administration

The following case illustrates well the acute and dangerous nature of this rare complication of sulphonamide administration—two-thirds of the patient's blood being destroyed by haemolysis in two days. The remarkably quick and complete recovery after cessation of sulphonamide administration and after blood transfusion is also typical.

CASE RECORD

On the evening of Sept. 11, 1944, a South African air mechanic aged 22 sustained minor second-degree burns of both legs from a petrol fire. He dressed himself with gentian violet and did not report sick until morning, when he was admitted to hospital. On admission his temperature was 100° F. His burns were cleaned with saline, dead skin was removed, and flavine in saline was applied. They were then lightly dusted with sulphanilamide powder and dressed with vaselined gauze. In view of his temperature he was put on a course of proseptasine (benzyl-sulphanilamide) by mouth also (1 g. 4-hourly). From then on, his clinical course was as follows:

Sept. 13.—Perfectly comfortable. Temperature normal.

Sept. 14.—Feeling rather miserable. Slight headache. Temperature 99.2° in evening.

Sept. 15.—Complained of feeling very weak, headache, and pains in both loins of a dull aching character. Complete loss of appetite. His burns were re-dressed in the morning as he complained of pain in the legs; they were perfectly clean. (Dressed with flavine—dusted with sulphanilamide powder—vaselined gauze.) Early in the afternoon he passed a quantity of urine which was deep red in colour and translucent. At the same time it was noticed that his conjunctivae were yellow. *Pathological reports* were:—(i) Urine: Alkaline; albumin +++; few leucocytes; few epithelial casts; bile, *nil*; alcoholic amidopyrine test, ++++. (ii) Blood (slide only): A marked poikilocytosis and anisocytosis, and polychromasia of the red cells; a few megaloblasts and normoblasts; no malaria parasites. Administration of proseptasine was stopped as soon as the haemoglobinuria was noticed. He had by then received a total

of 17 g. in 3 days, plus a small amount of sulphanilamide locally on the burns (estimated at approximately 3–4 g.).

Sept. 16.—Temperature 100° F.; pulse 88. Felt very ill. Marked anorexia and nausea. Obvious icterus—lemon-yellow colour. Pains in loins ++, and tender on palpation over kidneys. Spleen and liver not palpable. Urine still a deep-red colour. Treatment: Fluids +++; sod. bic. 30 gr. 4-hourly; burns were re-dressed to wash away all trace of local sulphanilamide; burns clean. Full Blood Examination:—R.B.C., 2,280,000 per c.mm.; W.B.C., 36,000 per c.mm.; Hb (Sahli), 55%; C.I., 1.2. Red cells: Anisocytosis, poikilocytosis, polychromasia of severe degree; megaloblasts and normoblasts in great numbers. White cells: polymorphs, 70%; monocytes, 10%; lymphocytes, 20%; no eosinophils or basophils seen. During the afternoon he was finding it difficult to drink enough fluid on account of nausea and occasional vomiting, so he was given 3 pints of fluid (glucose-water 2 pints, glucose-saline 1 pint) intravenously.

Sept. 17.—Symptoms exactly the same as on the 16th; felt very weak and looked very yellow. Urine: Alkaline; very deep red colour—translucent; few red cells; few leucocytes, no casts; alcoholic amidopyrine test, ++++; albumin, ++++. Blood: Hb, 32%; Group O (IV). In view of the haemoglobin level a transfusion was considered necessary. During the afternoon he was given two pints of Group IV blood by slow drip, followed by one pint of glucose-water. After the first half-pint of blood he suddenly felt much better and began to talk cheerfully.

Sept. 18.—Much better. Appetite returning. Still slight icterus of conjunctivae. No tenderness over kidneys—no pain in loins. Morning urine—light-red colour; afternoon urine—clear. Blood (afternoon): Hb, 37%; W.B.C., 13,900 (polymorphs 68%, lymphocytes 25%, monocytes 7%); R.B.C., 2,300,000 per c.mm. Red cells: Cells improved in appearance—poikilocytosis, etc., much less; very few normoblasts and megaloblasts seen (much fewer than in last film).

Sept. 19.—Felt well and cheerful, though still weak; appetite normal. Urine: Clear; alkaline; albumin, faint trace. Sugar, *nil*; no blood or casts; few leucocytes only.

A final blood examination, made on Sept. 22, was as follows: R.B.C., 2,910,000; Hb, 58%; C.I., 1.0; W.B.C., 23,000 (polymorphs 74.5%, lymphocytes 20%, monocytes 5%, eosinophils 0.5%); no megaloblasts, normoblasts, or myelocytes seen. Fragility: normal—haemolysis in 0.3% saline.

His further clinical course was uncomplicated, and he was discharged back to duty five days later.

This man had never previously been ill, and was quite certain that he had never been given sulphonamide drugs before. It is regretted that no further investigation could be made, as the case occurred in a mobile field hospital of the R.A.F. on active service.

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Duodenal Atresia in a Newborn Infant

Successful treatment of this condition is, I believe, uncommon; the following case may therefore prove of interest.

CASE HISTORY

The baby, a male, was born on May 26, 1945, in the Royal Maternity Hospital, Belfast. The weight at birth was 8 lb. 2 oz. There were two previous children, both normal and healthy. On the first day he vomited fluid which was viscid and stained with bile. The vomit was projectile in character and was more severe on the following day. Meconium was passed on the third and fourth days, and as the vomiting was still more pronounced a barium-meal examination was made. This showed almost complete gastric retention at four hours.

The baby was transferred to the Belfast Hospital for Sick Children, its weight having fallen to 6 lb. 4 oz. There was some distension of the upper abdomen, and increased gastric resonance was noted on percussion. The general condition was fairly good, although dehydration was obvious. It was decided to attempt gastro-enterostomy, and dehydration was combated by subcutaneous infusion. Laparotomy was performed (Mr. J. S. Loughridge), when it was found that the stomach and first part of the duodenum were much dilated. There was a good deal of matting of the small intestine by adhesions. The caecum was freely mobile and was situated in the mid-abdomen. A side-to-side gastro-enterostomy was done between the stomach and jejunum. The operation time was 35 minutes.

Apart from considerable shock after operation, progress was uninterrupted. Thirst was relieved by half-normal saline by mouth, and next day breast milk was given by means of a Belcroy feeder. On the fourth day success was assured, and a gain in weight of 10 oz. was recorded. The baby was discharged home on the seventh day after operation. Progress has been uninterrupted, a steady gain in weight being reported.

I wish to express my thanks to Dr. F. M. B. Allen and Mr. J. S. Loughridge, under whose care the infant was, for permission to publish these notes.

Belfast. PATRICIA LEITCH, M.B.,
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Reviews

SURGERY OF THE HAND

Surgery of the Hand. By Sterling Bunnell, M.D. (Pp. 734; illustrated. 72s.) London: J. B. Lippincott Company.

Dr. Bunnell's remarkable book is the outcome of a life devoted to one special field of surgery, and it is a brilliant achievement. Most people accept their hands without any thought of the amazing complexity of their mechanism or of what a deformity or an injury may mean. To most surgeons this book will be a revelation.

The author has attacked his subject with massive thoroughness. Starting with the study of comparative anatomy, he then discusses the normal mechanism of the hand and methods of examination in great detail, and these chapters are ingeniously followed by a chapter on the reconstruction of the hand to restore its normal mechanism. The correction of deformities, whether due to contractures of the soft structure or to abnormalities of the bones, is then discussed. There follows a chapter on the repair of injured nerves, evidently the result of wide experience, and the author then takes up the even more difficult problem of the repair of tendons and of the intrinsic muscles of the hand. A large section follows devoted to the mechanism of injuries and to infections of the hand and their modern treatment, and the volume ends with a discussion on congenital deformities and of neoplasms.

So far as we are aware no book has ever been produced dealing with such thoroughness with injuries of the hand, and certainly none which so impresses upon one the vast importance of this subject. The author seems to deal with nerve injuries, deformities, and infections with equal facility, and perhaps the chief attraction of the book is that it so obviously all arises from his own experience. It is impossible to give any idea of the vast amount of detail which he has brought together, or of the minuteness with which the most complex procedures are described, but so thorough are the descriptions that any competent surgeon will be able to carry out in his own practice every operation. The illustrations throughout are superb, whether they are photographs or diagrams to explain minute points of detail. We would congratulate the author on a magnificent achievement, and urge any surgeon who ever has to operate on a hand to make his own the vast experience recorded in this volume.

MICROBIAL ANTAGONISMS

Microbial Antagonisms and Antibiotic Substances. By Selman A. Waksman. (Pp. 350; illustrated. $3.75.) New York: The Commonwealth Fund. 1945.

To see penicillin in correct perspective it is necessary to understand that it is only one, though therapeutically the most useful, of many similar substances formed by micro-organisms. That antagonism between different species is expressed in the formation of such substances has been recognized since the earlier days of Pasteur's work. For a broad conspectus of this phenomenon, long neglected in its wider aspects, and now exciting the liveliest interest, we can recommend Selman A. Waksman's new book, *Microbial Antagonisms and Antibiotic Substances.* The author is microbiologist to the New Jersey Agricultural Experimental Station; he has done important work in identifying antibacterial substances produced by *Actinomycetes,* and is largely responsible for popularizing the use of the word "antibiotic." He almost reconciles one to its use by contrasting "antibiosis" with symbiosis, these being two opposite forms of mutual relationship which mixtures of microbic species may exhibit in Nature. The subject is approached by way of the flora of soils and water and the competitive or antagonistic interrelationships which exist between the species found there. Methods of isolating and testing antibiotic substances are then described, following which there are accounts of those produced by bacteria, *Actinomycetes,* and fungi; the numbers of these hitherto identified are given as 11, 7, and 15 respectively, but it need scarcely be said that besides these adequately studied and characterized products there are believed to be many others. Other chapters deal with the chemical nature of these products, their mode of action,

and their practical application for the control of disease in both animals and plants. There is an extensive bibliography (1,016 references given in full) and two indexes are provided, one being confined to the names of micro-organisms.

This survey, apart from its value as a scholarly treatise on a subject of great importance, seems almost to introduce a new philosophy into microbiology. Viewed as a series of warring tribes, our microbic friends and enemies seem more human—if such an expression may be used—and a good deal more vulnerable, than we had thought.

TELEPATHY AND THE GROUP MIND

Telepathy. An Outline of its Facts, Theory, and Implications. By Whately Carington. Second edition. (Pp. 176. 12s. 6d.) London: Methuen and Co. 1945.

Largely as a result of very careful experiments by such workers as Dr. Rhine and Dr. Soal, telepathy, clairvoyance, and precognition have been shown to be fit subjects for scientific research. In the words of Dr. Thouless, "the evidence for the reality of the phenomenon is now so overwhelming that scepticism can only be justified by ignorance of the experimental results." It is not so much that the sceptical feel called on to boggle at the results as that they find them impossible to fit into any reasonable theory. It is greatly to the credit of Mr. Carington, who has himself done some notable experiments, that he has evolved a theory which, though incompatible with a purely materialist philosophy, is a truly scientific one in that it can itself be tested by experiment.

Most of the worth-while experiments have been of the card-guessing type, in which high proportions of successes have been obtained despite extreme precautions to prevent any normal communication between experimenter and subject. Possible explanations by a "sixth sense" or by "wireless waves" can apparently be excluded. It makes no difference to success whether experimenter and subject are separated by the wall of a room or by a range of mountains. Mr. Carington suggests that we should not look for explanation along such lines at all. He proposes the theory that the sensa and images which are our minds are to some extent independent of physical processes in the brain, and are not wholly independent of the sensa and images which are the minds of other people. So that if A and B are presented together to the mind of Smith, not only will A be subsequently likely to call up by a process of association the image of B when it is presented to Smith, but also when it is presented to Brown. Similarly, when the experimenter in a card-guessing experiment turns up a certain card this card is associated in his mind with the idea of the experimental situation, and the subject, who is placed in the same situation, has a more than chance probability of associating with it the image of the same card. The laws of association may then be expected to obtain; and in fact there is some evidence that the laws of recency and repetition do hold good.

This leads Mr. Carington to a discussion of the group mind. He points out that minds which hold a great deal of their sensa and images in common may be especially favourably constituted for telepathic communication. One could suggest, for instance, testing this by having husbands and wives, or, better, uniovular twins, as experimenter and subject. Groups of people who lead very similar lives, such as primitive tribes, would be expected to be more liable to telepathy than civilized groups; and in the case of some animals, such as shoals of fish or armies of ants, it would not be surprising if the evidence for a group mind were still stronger.

This is an extremely interesting and, though often highly speculative, a thought-provoking book.

OTO-RHINO-LARYNGOLOGY

Diseases o the Nose, Throat and Ear. A Handbook for Students and Practitioners. By I. Simson Hall, M.B., Ch.B., F.R.C.P., F.R.C.S.Ed. Third edition. (Pp. 459; illustrated. 15s., plus 9d. postage.) Edinburgh: E. and S. Livingstone. 1944.

A third edition of this book is evidence of its popularity with those students who require a general though necessarily superficial survey. Dr. Simson Hall states that the subject-matter has been thoroughly revised and brought up to date, but it is not easy to find confirmation of this. Chemotherapy is relegated to an appendix instead of being incorporated in the text at the appropriate places; nor is a proper appreciation of either its status or its limitations attempted; and the magic word "penicillin" does not appear at all. By no means all the errors of the previous editions have been eliminated. For instance, the manipulation described for the introduction of the Eustachian catheter could not possibly induce it to enter the orifice of the tube, and the strengths of cocaine in solution recommended are much greater than necessary and not without hazard. At present the indications for the fenestration operation for otosclerosis and other forms of deafness are certainly unsettled, but are the cause of much interrogation both of practitioners and of otologists; yet the author gives no guidance, though he is admittedly one of the few in Great Britain entitled to speak with authority on the subject. Useful as the book surely is, the author has still not made full use of the opportunity for instruction which such a textbook provides.

Notes on Books

Mr. ALECK BOURNE'S *Synopsis of Obstetrics and Gynaecology* has now reached its ninth edition (Bristol: John Wright and Sons; 21s.). There have been many changes, both of addition and of omission. This book is, as before, an attempt to present facts to the student in a precise manner and thereby give him a foundation for building up his own experience. As the author says in his preface, "During our younger years we must learn facts. . . . No book, least of all a synoptic book, can replace attendance in the clinics."

Dr. J. G. BAUMGARTNER'S book *Canned Foods: An Introduction to their Microbiology* was highly commended in these columns on Aug. 7, 1943. A second edition is now published by J. and A. Churchill Ltd. at 12s. 6d. Among various changes from the original text there is a new chapter summarizing some of the literature on the microbial condition of marketable tinned food and indicating briefly the practical aspects of this matter. A number of methods useful in the bacteriological control of such foods have been added, and these, together with raw-material tests, form the subject of another chapter. In its present expanded form the book will prove even more helpful to medical officers of health and sanitary inspectors, and to public health and industrial bacteriologists.

A ninth edition of J. M. Lowson's well-known *Textbook of Botany*, revised and largely rewritten by Dr. W. O. HOWARTH and Dr. L. G. G. WARNE, of the Department of Botany in the University of Manchester, has been published at 12s. 6d. by the University Tutorial Press, Ltd., Clifton House, Euston Road, N.W.1. The text has been brought up to date to conform with modern ideas, modern teaching methods, and examination requirements, and many illustrations have been drawn for this edition by Miss M. W. M. Jepson, a skilled botanical artist.

John Wright and Sons Ltd. have published at 5s. a 23rd edition of *Our Baby: for Mothers and Nurses*, by the late Mrs. J. LANGTON HEWER. The booklet (now in its 223rd thousand) has once again been revised from the medical point of view by Dr. Margaret Scott-Brown, with the aim of leaving Mrs. Hewer's fundamental doctrine unchanged while bringing the material into line with modern ideas.

Rebuilding Family Life in the Post-War World, edited by Sir James Marchant, with an introduction by Lord Horder, was noticed in a leading article on Aug. 25 (p. 258). In addition to the 2s. paper-bound edition a 3s. 6d. edition is now available in cloth boards. The publishers are Odhams Press, Ltd.

We have received from the Sterling Hall of Medicine, New Haven, Connecticut, the fifth annual report of the Historical Library of Yale University School of Medicine. This includes a review of the first five years by Dr. J. F. Fulton, chairman of the Advisory Board. Six years have elapsed since Harvey Cushing's death, and in that interval there has been ample opportunity to see the wisdom of his plan for combining his books with those of his friends in the hope of building up at Yale a library on the history of medicine and science that would be second to none.

In view of the acute shortage of nurses, the Minister of Health has been in consultation with the Minister of Labour and National Service and the Service Ministers with regard to arrangements for the early release from H.M. Forces of individual State-registered nurses on account of their special qualifications or to fill key positions in the civilian health services. It has been agreed that where the Ministers of Health and of Labour are satisfied on the application of an employing authority that the early release of a particular nurse is desirable, on the ground that he or she is needed either for a key position or for a vacancy requiring the possession of a special qualification which cannot otherwise be filled, the Service Ministers will consider release under Class B, assuming that the nurse is willing to accept such release.

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CARBON MONOXIDE POISONING

The danger of carbon monoxide has existed since fire was known to man. It is a colourless and odourless gas which arises from the incomplete combustion of carbonaceous matter. The introduction of coal-gas for domestic use and the invention of the internal combustion engine in the last century have heightened the risks. At present carbon monoxide is a popular suicidal poison, besides being a serious industrial hazard; it is, in fact, the cause of between one-half and one-third of all the reportable gassing accidents in factories in Great Britain: 226 cases were reported in 1941, with 239 in 1942 and 225 in 1943.[1] The risk exists in many industries, but blast furnaces and gas-producers account for nearly a quarter of the cases. In the chemical industry the manufacture of ammonia by the Haber and Bosch procedure, the synthetic production of methane and methanol, and the manufacture of soda with the Le Blanc process are the principal hazards, though charcoal burners and carbide workers may be exposed to risk. In the mining industry the main hazards result from fire-damp explosions, but the gases of explosives sometimes contain high concentrations of CO, so that blasters may be heavily exposed. Workers in the clothing, ceramic, and electrical industries, besides linotype operators, chimney sweeps, firemen, boiler-cleaners, cooks, and bakers, may become exposed, as well as workers in the motor industry—for instance, in garages and repair shops.

A full review of the literature of the hazards of carbon monoxide and of the mechanism of its action has now been published by von Oetlingen.[2] The gas possesses the property of combining with the haemoglobin of the red blood cells to cause chemical asphyxiation. The amount of carboxyhaemoglobin formed depends on the concentration in the atmosphere, the duration of exposure, and the respiratory rate of the person exposed. An increase in the temperature, humidity, and carbon dioxide content of the air, or a decrease in the oxygen content, however, will stimulate respiration and hence the amount of CO absorbed will be increased. The formation of carboxyhaemoglobin causes a corresponding reduction in oxyhaemoglobin, but the toxic effects are not entirely due to the anoxaemia brought about by this reduction in the oxygen-carrying power of the blood. The oxygen supply to the tissues is further reduced, because carboxyhaemoglobin interferes with the dissociation of oxyhaemoglobin, besides causing a reduction in the available reduced haemoglobin and in this way interfering with the carrying and dissociation of CO_2. Carbon monoxide may also react with other haem-containing pigments such as pseudo-haemoglobin, myoglobin, or cytochrome, but it is not certain whether the function of these pigments, or of those found in the brain, is affected by the poison. The early symptoms of poisoning include giddiness, a sense of oppression in the chest, a band-like feeling of constriction round the head, nausea, and throbbing of the heart; then follows loss of power in the lower limbs, and the patient falls helpless and loses consciousness. With concentrations of carboxyhaemoglobin below 20% the symptoms are negligible. They increase between 20 and 50%, while with concentrations between 50 and 80% there is danger to life from respiratory paralysis and cardiac failure.

Polycythaemia not infrequently results from CO poisoning, but this phenomenon is not merely an attempt of the organism at compensation. Hartridge[3] pointed out the slow return to normal values and argued against a temporary hyperactivity of the blood-forming organs, while Brieger[4] produced in a dog permanent polycythaemia which persisted more than a year with red blood cells 40% above the original level and haemoglobin 30% above it. Barcroft[5] has shown that the increase in circulating blood cells may be due to a contracture of the spleen, and Dittmar,[6] among others, has suggested that the phenomenon is due to a central mechanism possibly resulting from injury to the corpus striatum. Polycythaemia, therefore, should be considered as an alarm signal. Analysis of the clinical picture and of the pathological findings in CO poisoning, especially in the circulatory and central nervous systems, appears to indicate that the sequelae are more serious than would be expected from mere anoxaemia of similar degree. These include headache, chest symptoms, coldness of the extremities, psychoses which are mostly of a depressive kind, prostration, and loss of vitality; while more remote effects are paralysis, loss of memory, hallucinations, and dementia.

The treatment of carbon monoxide gassing must be directed to the restoration of normal breathing and the abatement of shock. The patient must be removed immediately from the contaminated atmosphere and artificial respiration started; the essential need is for oxygen to overcome the decreased oxygen-carrying power of the blood and to promote the dissociation of carboxyhaemoglobin. Cold and physical exertion should be avoided. Venesection, lumbar puncture, catharsis, and intravenous injections of hypertonic solutions may be considered when hyperaemia and oedema of the brain appear. Morphine and atropine must never be used. The former is a depressant of the respiratory centre, while the latter causes dilatation of the bronchioles, interfering with the elimination of CO through the lungs. As with all industrial accidents, however, prevention is much more important than treatment, and this can be achieved by insisting on proper lay-out and maintenance of plant and adequate safety precautions—such as the erection of warning notices, and the provision of safety belts and breathing apparatus. Service respirators are not proof against CO, but special breathing apparatus has been manufactured consisting of the usual type of Service face-piece connected to a length of strong wire-embedded air-piping, the free end of which

[1] Memorandum on Carbon Monoxide Poisoning. Factory Department—Ministry of Labour and National Service. Form 827. H.M.S.O., 1945.
[2] *Public Health Bulletin*, No. 290, 1944, U.S. Public Health Service.
[3] *Lancet*, 1928, **1**, 1137.
[4] *J. industr. Hyg.*, 1944, **26**, 321.
[5] *J. Physiol.*, 1925, **60**, 79.
[6] *Dtsch. med. Wschr.*, 1939, **65**, 500.

is secured in the fresh air. There are several methods for detecting and estimating CO in the atmosphere. The oldest makes use of mice or canaries, which resemble human beings in their response to it. Taken into a confined space in a cage and kept under observation by the workers, they will show signs of distress if dangerous fumes are present and the place needs to be evacuated. Several proprietary instruments are also available; they make use of the reaction with either palladium chloride or iodine pentoxide, and though convenient do not indicate concentrations of less than about 50 parts in 100,000 of air.

Is there such a thing as chronic carbon monoxide poisoning? It depends how one interprets the word "chronic." Chronic poisoning usually means the repeated or continued administration of small quantities of a poison resulting finally in toxic symptoms. Manifestly, however, there are circumstances in which "repeated mild acute" poisoning and "chronic" poisoning amount almost to the same thing. There is no evidence that CO as such, or in combination with other compounds, remains in the tissues for any considerable period of time, and so far there is no evidence that concentrations of CO which cause no acute subjective or objective symptoms will affect any structures of the organism in such a way as to lead to functional or permanent injury. The methods available for measuring small amounts of carboxyhaemoglobin have not so far been very sensitive, but it is hoped that with the development of new and accurate spectrophotometric methods it will be possible to establish how long CO absorbed by a man during an eight-hour work-shift remains in the tissues. On the whole, the reported clinical signs and symptoms of "chronic" carbon monoxide poisoning are indefinite and not characteristic; headache, vertigo, weakness and ataxia of the legs, and psychic manifestations are those most often mentioned. Lewey and Drabkin[7] have reported some experiments in which dogs were exposed for 5½ hours a day, 6 days a week, for 11 weeks, to an atmosphere containing 0.01 vol. % of carbon monoxide, which caused a carboxyhaemoglobin level of 20%. This concentration was chosen because the U.S. Department of Labour, following a report by Bowditch and his colleagues,[8] had set 0.01 vol. % as the limit of safe concentration of CO in the air in industrial plants. All the dogs showed consistent disturbances of postural and position reflexes and of gait, and some an abnormal electrocardiogram[9] characteristic of anoxia. Histological examination of the central nervous systems three months after the end of the experiment showed changes in the cortex and white matter of the cerebral hemispheres, in the globus pallidus, and particularly in the basal ganglia. They followed in their distribution the course of the blood vessels, the walls of which were damaged only occasionally. The implications of these findings with respect to chronic CO poisoning in man are uncertain, but it is clear that repeated prolonged exposure to 0.01 vol. % of carbon monoxide is not innocuous for the heart and central nervous system in dogs. There is need, therefore, for work to clarify the situation in man, and to establish whether chronic CO poisoning does or does not exist.

[7] *Amer. J. med. Sci.*, 1944, **208**, 502.
[8] *J. industr. Hyg.*, 1940, **22**, 251.
[9] Ehrich, W. E., Bellet, S., and Lewey, F. H., *Amer. J. med. Sci.*, 1944, **208**, 511.

SURGICAL SCIENCE IN ENGLAND

The Scientific Report of the Royal College of Surgeons of England for the year ending July 31, 1945, not only is a record of the work in the scientific departments but contains many indications of the future policy of the College in regard to these departments. Perhaps the most important new development has been the inauguration of lecture courses in anatomy, applied physiology, and pathology, to which is being added a course of lectures on surgical topics by prominent surgeons. The College appears to have taken the first step towards becoming a postgraduate teaching institution. Whether it will go further and link up its teaching in the medical sciences with a university remains to be seen. The Goodenough report suggests that institutes for postgraduate education should be either departments or schools of universities. The advantages to be derived from a close liaison between the College and the University of London are too many to be lightly dismissed.

With the appointment of Prof. Wood Jones to the Collins chair of anatomy the three departments of anatomy, pathology, and experimental surgery have each a head. The report suggests that in anatomy and pathology the primary duty of the heads of these departments is to rebuild the museum collection. It is to be hoped that sufficient staff will be given to these departments to ensure that the time of the heads of them will not be occupied exclusively by museum work. These departments can do much to advance knowledge and to disseminate it. The College Museum is the obvious place to become the repository of a national type collection of tumours. The experience in this field of its professor of pathology would make such a collection unique within a very few years. It is most encouraging to note the great number of accessions to the museum collections of anatomy and pathology. When it is remembered how many young surgeons, always strong supporters of the College Museum, are still on national service, the year's total of new specimens is a good augury for the future.

The brief summary of the work in the research laboratories during the war years emphasizes the importance of patient work on some fundamental theme out of which develop inevitably lines of attack on diverse problems. Starting with the observation that infusions of plasma after the cessation of haemorrhage caused blood dilution to reach an upper limit after which further dilution was not observed in spite of continued plasma infusion, this led to experimental work which showed that the plasma proteins infused are not retained in the blood stream but move out of it at a relatively rapid rate once the normal blood volume has been attained. In a series of experiments the mobility of some of the body proteins was demonstrated and the ability of these to move into the blood stream under suitable conditions was proved. The steps which led to a study of protein synthesis in the liver in health animals and in patients suffering from one or other of the various hepatic diseases are set out in detail in the report. The great increase in protein destruction consequent on any trauma has been noted by many observers. Destruction also occurs in hepatic diseases such as acute infective hepatitis. The work on hepatic disease by the laborato

staff has provided many valuable clues to the causes of nitrogen loss after injury, and it is to be hoped that these will be followed up. Nothing is more disheartening to a patient than a slow convalescence. War experience, in which the College laboratories shared, has demonstrated how recovery can be speeded up and healing accelerated when the feeding of patients after injury or operation is tackled on scientific lines. The few observations recorded in the report which were made in Holland by the laboratory staff after the liberation of that country whet the appetite for the full report of this work. Cessation of the healing process under conditions of acute protein deprivation is an interesting observation and raises many problems worthy of study. The report of the laboratories ends most appropriately by posing several questions on the problem of protein breakdown after trauma: "Is the breakdown an essential process in the initiation of repair, or is it merely the effect of trauma? The breakdown process when brought to a halt or slowed down because of extreme emaciation is coincident with a cessation of healing. If we regard the processes of repair as being but a special case of growth it is possible that the hormones essential for growth of the immature animal are equally essential in repair."

OCULAR SIGNS OF ARIBOFLAVINOSIS

Much confusion still exists concerning the ocular signs of ariboflavinosis, or riboflavin deficiency. After the publication in 1940 of the observations of Sydenstricker and his colleagues[1] on the ocular manifestations of this condition, circumcorneal injection and corneal vascularization were accepted as certain diagnostic signs and used in nutrition surveys as an index of riboflavin nutrition. On the basis of ocular signs the incidence of ariboflavinosis has been reported as high as 99.5%[2] and as low as 3%[3] in the subjects examined. The incidence reported seems to depend on whether the observers were ophthalmologists—and therefore conversant with the appearance of the limbus under different conditions and with the different kinds of corneal vascularization—or not. The ophthalmologists report a low incidence of ariboflavinosis based on ocular signs. Bessey and Wolbach[4] in 1939 showed that the earliest detectable sign of ariboflavinosis in rats is corneal vascularization. Since then some observers have extended this to include circumcorneal injection, or engorgement of the limbic loops. Others have not discriminated between this and ciliary congestion, and between an engorged limbus and an actual invasion of the cornea by new vessels.

Is circumcorneal injection pathognomonic of riboflavin deficiency? Stannus[5] has examined between four thousand and five thousand eyes by slit-lamp microscopy, and has seen both corneal vascularization and circumcorneal injection without any evidence of ariboflavinosis. The vessels of the limbic plexus may appear avascular because they are constricted and empty. The slightest stimulus may cause them to become congested and engorged. This occurs in all varieties of conjunctivitis, in those whose eyes are exposed to heat and dust, cold wind, bright light, and mild infection. It may also result by just rubbing the eye,[6] and may come and go in the same individual with considerable rapidity. Engorgement of the limbic vessels is, therefore, not a sure sign of ariboflavinosis, which should be diagnosed only when new capillaries are observed budding from the apices of the limbal loops and extending on to the cornea. Even then the change should be present in both eyes and round the whole corneal circumference, and it should respond rapidly to treatment with riboflavin. Corneal vascularization may also occur in the absence of ariboflavinosis. Thus it has been noted as a result of vitamin-A deficiency, tryptophane deficiency, injury to the corneal epithelium by chemical irritants, and diseases such as trachoma, phlyctenular keratitis, and any superficial keratitis. The instillation of soap solution into the conjunctival sac may also cause collapsed, afunctional blood vessels in the cornea to become engorged.

Ida Mann[7] has recently recorded a new type of corneal lesion due to riboflavin deficiency. The cornea shows marginal vascularization and opacities in the substantia propria. The vascularization, which is distinctive and differs from that hitherto described, is in the form of parallel, radially arranged loops springing from the apices of the loops of the limbic plexus and extending over the cornea in three arcades beyond this, slightly more than half-way to the pupil margin. The vessels, which are so engorged that they stand out from the surface, are mostly subepithelial, although in the region of the opacities they penetrate the substantia propria. They extend all round the circumference of the cornea. This is probably a true manifestation of ariboflavinosis, as the engorged vessels rapidly empty and the opacities clear after treatment with riboflavin.

RECURRENT PAROXYSMAL ABDOMINAL PAIN

Transient acute abdominal pain affecting an apparently healthy person is often difficult to explain; if the symptoms are of short duration, and if operation is clearly contraindicated, precise diagnosis may be impossible. From time to time, however, little groups of cases are separated from the mysterious majority, and the number of the unexplained grows gradually less. Attacks of abdominal pain have long been known in subjects of erythema and of purpura; fifty years ago Osler[8] wrote of the visceral complications of the "erythema group," and the acute abdominal manifestations of Henoch's purpura have been recognized for even longer. Siegal[9] has now attempted to distinguish in a separate clinical category an acute affection similar to the abdominal accompaniments of erythema and purpura but free from florid cutaneous eruption. According to Siegal this syndrome is characterized by recurrent paroxysms of severe abdominal pain, diffuse and cramp-like or localized and gnawing. The attacks are said to begin as a rule in the second or third decade, and they continue for many years without affecting the patient's general health. Early attacks may be noted only once or twice a year, but later a more frequent cycle is established, the pain recurring weekly or monthly. The temperature rises during an attack, sometimes to 104° or 105° F. Nausea, vomiting, and diarrhoea may occur; the abdomen is tender, the abdominal muscles may be spasmodically contracted, and rebound tenderness is sometimes elicited. There may be pain in the chest, too, and sometimes shoulder pain; prostration may be extreme, and the white count is high.

One of Siegal's patients was submitted to laparotomy during an acute attack of pain, and the subserous vessels of the ileum, caecum, and sigmoid colon were seen to be congested. From this evidence, and from the abdominal

[1] *Publ. Hlth. Rep. Wash.*, 1940, **55**, 157; *J. Amer. med. Ass.*, 1940, **114**, 2437.
[2] *Canad. med. Ass. J.*, 1943, **49**, 5.
[3] *British Medical Journal*, 1943, **2**, 134.
[4] *J. exp. Med.*, 1939, **69**, 1.
[5] *British Medical Journal*, 1944, **2**, 103.
[6] Ibid., 1943, **2**, 134; *Lancet*, 1944, **1**, 431.
[7] *Amer. J. Ophthal.*, 1945, **28**, 243.
[8] *Amer. J. med. Sci.*, 1895, **110**, 629.
[9] *Ann. intern. Med.*, 1945, **23**, 1.

tenderness and rebound tenderness which are present during acute attacks, Siegal suggests that the name "benign paroxysmal peritonitis" be applied to the condition until the aetiology and pathogenesis are better understood. There is still room for argument whether the existence of this syndrome as a distinct entity is justified, and whether, if it is justified, Siegal's title for it is suitable. But Siegal goes further, and suggests, though only tentatively, that the abdominal symptoms are due to allergy. A family history of allergy was elicited in the majority of cases, and urticarial wheals were occasionally observed during acute attacks, but positive allergic reactions were seldom elicited in affected individuals. In no case was any allergen proved capable of initiating an attack, and the hypodermic administration of adrenaline gave no relief from pain. That acute abdominal symptoms may accompany urticaria and angioneurotic oedema is certain, and there is no reason to doubt that some forms at least of paroxysmal abdominal pain may be allergic in origin, even if unaccompanied by cutaneous manifestations. It would be wrong, however, in any individual case to ascribe acute abdominal symptoms to hypersensitization unless clear evidence of allergy were obtained. The only certain proof would be the precipitation of an attack of pain by the administration of the responsible allergen. If Henoch's purpura be excepted no precise account yet exists of an abdominal syndrome which, from the abdominal evidence alone, can be regarded as characteristic of, and peculiar to, the allergic state; it is equally doubtful whether the abdominal symptoms of frankly expressed allergy are due to peritonitis.

HUMAN LISTERELLOSIS

Listerella or *Listeria monocytogenes*, so called because of the blood picture associated with it, was first identified by Murray, Webb, and Swann as the cause of an epizootic among laboratory rabbits at Cambridge. Since then infection by this organism has been recognized in various other animals, and 23 cases of human infection have been reported. These are reviewed by M. M. Kaplan,[1] together with 13 earlier cases almost certainly of the same nature, although the organism in the then state of knowledge was merely described as a diphtheroid bacillus. All 36 patients suffered from one of two conditions—a meningitis with a high mortality, or infectious mononucleosis. The most recent case of the latter type was fully described by Webb[2] himself. The patient was a medical student with typical infectious mononucleosis, including a heterophile agglutinin titre of 1 in 2,048. The organism was cultivated from the blood, and shown by exhaustive examination to be a true *List. monocytogenes*; the only element of doubt in these findings was the absence of the agglutinin for the organism itself in the patient's blood after recovery. It is by no means accepted that *List. monocytogenes* is even a common cause of infectious mononucleosis; the few reported cases in which it has been found suggest only that further search for it should be undertaken. As Kaplan points out, there are other mysteries connected with this organism: neither its natural habitat nor the portal of entry is known, and it is a striking fact that no carrier has ever been identified, either human or animal. Infection in newborn infants nevertheless suggests transmissibility from an unrecognized human source. Both the experimental and the human disease respond to sulphonamides, but the organism is insensitive to penicillin. Only a condition which may be described as "Listerella consciousness" among clinical bacteriologists will enable knowledge of this interesting infection to be extended. Whenever pathogenic activity is attributable to a short thin Gram-positive bacillus exhibiting motility, it may be worth while to inoculate a rabbit intravenously: a sublethal dose produces an extreme mononucleosis, and the main result of fatal infection is the production of focal necrosis, most marked in the liver but also found in the spleen and lungs.

[1] *New Engl. J. Med.*, 1945, **232**, 755.
[2] *Lancet*, 1943, **2**, 5.

EFFICIENCY OF ULTRA-VIOLET APPARATUS

In another column will be found a paper by Fl. Lieut. B. C. Elliott on the efficiency of ultra-violet-light apparatus which may, at first sight, appear too technical for the majority of the medical profession. The paper has, however, aspects of clinical importance, and the conclusions reached, based as they are on well-proved scientific facts and careful experiments, should be known to every practitioner who employs ultra-violet light either himself or by prescription. Reduced to simplest medical terms Elliott's paper poses three questions: (1) Do ultra-violet lamps deteriorate with use to any important degree in the output of therapeutic biological rays? (2) Is the apparatus used for testing during manufacture efficient as a means of ensuring that the necessary biological rays are present in apparatus sold to the public? (3) Is the testing apparatus commonly used for servicing an efficient means of measuring those biological rays? The author answers the first two questions in the affirmative and the third in the negative. It will be well, therefore, to examine these questions and answers from the clinical point of view. An ultra-violet lamp which deteriorates in the most potent of its therapeutic rays more rapidly than in other parts of the spectrum can, clearly, lead to false clinical impressions of its efficiency as a therapeutic agent. Elliott's researches were directed to the production of a simple portable testing outfit, the sensitivity of which was maximum for the more therapeutically valuable rays. During the course of his investigations the laboratory testing apparatus of one of the largest manufacturers was submitted for investigation and found to be fully efficient. This by itself is a comforting thought, and means that care and scientific precision are exercised before new models are sold to individuals or the trade. But when he came to look into the servicing side and the efficiency of second-hand models he found a completely different state of affairs. The apparatus provided for use during servicing is of a type that can give a misleading picture of deterioration in the biologically active part of the spectrum. The author has not found it possible to comment on the apparatus of other manufacturers than the one who holds a virtual monopoly in ultra-violet lamps for therapeutic purposes. For example, the type commonly known as the cold quartz ultra-violet lamp does emit the biologically active rays, but its usual output in comparison with the new electronic mercury vapour tubes is relatively poor. He has designed, with the help of Mr. E. J. Bowen, F.R.S., of the Nuffield Physical Chemistry Laboratory, Oxford, an easily operated, robust, portable testing apparatus, which takes into consideration all the necessary medical desiderata, and it has been checked over a long period against high-precision apparatus.

The lessons to be learned from Elliott's paper are therefore that all therapeutic ultra-violet lamps should be serviced at regular intervals and that the testing should be carried out only with apparatus approved by an impartial body such as the National Physical Laboratory. It behoves us, therefore, to ensure that deterioration of such apparatus is not mistaken for clinical inefficiency.

LESSONS OF WARTIME EXPERIENCE

[FROM A CORRESPONDENT]

Those of us who have served as medical officers in tropical theatres of war may at times have envied our brethren in Europe the superior facilities for work which they enjoyed. But to the physician at least medicine in the Tropics offers interest, variety, and an insight into the large-scale problems which can hardly be obtained elsewhere. It is a mistake to think of tropical medicine as being exclusively concerned with "tropical" diseases. These there are in plenty, but as well as, not instead of, the more familiar illnesses of temperate climates. There is danger, now that the war has ended so abruptly, lest we shut the door on the experiences of the past, forgetting alike failures and successes in a pleasant glow of self-congratulation. It will be a pity if we do not try to profit by what we have learned, for the problems are far from solved.

The lesson which was perhaps most firmly driven home was the real meaning of hygiene and sanitation. The British Armies operating in the Middle East, Africa, India, and S.E.A.C. were for the most part surrounded by populations at a very low standard of Western culture. In all these theatres some, and in many of them the greater part, of the troops for which British medical officers were responsible were recruited from Asiatic or African races. The average British officer or soldier can be very unreceptive of the elementary principles of hygiene, but at least he has been accustomed to good health standards at home. Many of the Asiatic and African troops have never known any such standards, while at some points measures of Western hygiene conflict with their social or religious prejudices.

Particularly in S.E.A.C. it was obvious that merely to treat disease was not enough. The problem was one of prevention. Though there is nothing new in this—it is a principle that has been reiterated over and over again by Army authorities and appears in every manual—it was by no means effectively applied. The figures published for 1943–4—roughly, 300,000 sick and 40,000 battle casualties—tell their own story. If the figures for 1944–5 are published they will probably show a marked improvement, at least in the figures for sickness. If this is so we should attribute the improvement to the vigorous application of three measures—the use of suppressive mepacrine against malaria, the use in forward areas of sulphaguanidine against dysentery, and the general use of D.D.T. against flies. There was, however, no new knowledge available in 1944–5 that was lacking in 1943–4. All that did happen was that supplies were at length made available to the theatre which probably needed them most sorely from the start, and that vigorous efforts were made by administrators to obey their own rules.

Scrub Typhus and Amoebic Dysentery

Neither mepacrine, sulphaguanidine, nor D.D.T., however, is likely to affect the two medical problems which, after malaria and bacillary dysentery, are the most serious—scrub typhus and amoebic dysentery. For an effective weapon against scrub typhus we have had to wait for the fruits of new knowledge in the shape of an effective vaccine. Sulphaguanidine has no counterpart in the treatment of amoebic infections and, despite the proved value of emetine in the acute stages in visceral amoebiasis, cure is uncertain, relapse frequent, and disability may be prolonged. But amoebic dysentery is preventable. Complete preventive measures, of course, were impossible for a division cutting its way along the valleys leading to the Chindwin, but an enormous gain would have been a diminution in the number of cases arising on the lines of communication, which picked off officers and men before ever they reached the fighting zone, or while they were travelling to or from leave and rest areas, or indeed in these areas themselves. The physician may be excused a little bitterness as he realized that the real answer to the crowded dysentery ward was not the drugs which were often in short supply, but properly fly-proofed latrines, clean and fly-proofed cookhouses, cooks trained and disciplined in hygiene, and control of railway stations and such restaurants as were accessible to the troops. An appeal to the D.A.D.H. usually found a man even more frustrated and harassed than the physician. Shortage of supplies, lack of trained personnel, and the impossibility of getting the sappers to do the work with the materials and labour at their disposal largely stultified his efforts. Such shortages, naturally, affected other things besides cookhouses and latrines. One hospital, working at capacity for nine months, had no ablutions for patients. The well was sunk and the pipes laid, but no pump was available.

Problems of Nutrition

Medical officers in the European theatres have had the opportunity, no doubt, of observing malnutrition in many different aspects. In the Middle East it was rare among the troops, although classical scurvy, pellagra, and xerophthalmia were seen in a camp of Libyan prisoners. In S.E.A.C., however, several manifestations of malnutrition appeared. It is arguable that some diet scales were inadequate, but everyone knows that all the items laid down on the scale do not always reach all the troops, and when supply is by air, as so often it was, it is inevitable that shortages and maladjustments should occur. Anorexia, sore tongue, diarrhoea (not that of sprue), and anaemia were common among many British troops evacuated while, and immediately after, Kohima and Imphal were besieged. Nutritional macrocytic anaemia was seen in African and Indian troops. Here again there was no lack of knowledge—the relevant biochemical facts were known and taught well before the war—but there were failures of supply, accentuated in the case of Indians by dietary customs which are only slowly breaking down. One could not help feeling at times that the official mind was beset by the fallacious belief that a diet approximating that to which the sepoy or the askari was accustomed at home was suitable for him under severe campaigning conditions. A moment's thought will dispel such a view. In very many cases he suffers at home from definite malnutrition, for which he pays with a heavy morbidity and mortality, while his output of work, mental or physical, is low. On active service he is expected to put forth the most severe physical efforts and to perform quite unaccustomed mental feats. For example, East Africans with only quite elementary education were turned into signallers, gunners, drivers, and quite good nursing orderlies. The question should be, not to how many calories and to how much protein have these people been accustomed, but how much do they need to do what we require of them?

Materials for Prevention

The Fourteenth once called itself the "Forgotten Army." That its members were forgotten by their friends was never true. That it received little publicity was true but immaterial. That it was starved of supplies of all kinds, including medical supplies, was a truth for which it had to pay a heavy price. It was short, too, of certain categories of soldiers. At one level there were far too few men capable of supervising the constructional work necessary to make proper hygiene possible, with the result that civilian contract labour of a most unsatisfactory type was employed. At a much higher level there were officers with large administrative responsibilities who had insufficient grasp of the problems involved and lacked the drive required to overcome the obstacles of formalism and vested interest standing in the way of improvement. That improvement behind the fighting zone was possible was shown by the comparatively high standard of hygiene achieved by the many fighting units operating under far worse conditions but under vigorous and able commanders.

Meanwhile the problems have not been conjured away by VJ-Day. Troops will inevitably remain in India and in S.E.A.C. for some time, and it is no less desirable to keep them out of hospital now than when fighting was still in progress. Once a man is admitted to hospital, treatment is surprisingly good in view of the difficulties. The chief problem is to prevent him from becoming a hospital case. It is not more hospitals or more medical officers that are required. The latter will remain impotent and frustrated in the face of conditions which they are powerless to alter. In fact, given more transport and some efficient clerical assistance (at present it takes an hour's hard writing to discharge ten patients from hospital) many medical officers could be released. What is required is a better supply of timber, wire gauze, water pipes, and all the material needed to construct hygienic camps, together with the necessary labour. Above all, there are needed in non-medical senior administrative officers a realization of the magnitude of the problem and a determination to solve it. There is a wider

problem still. The majority of the world's population lives at appallingly low hygienic levels. Many thousands of them, Africans and Indians in particular, have given to Britain loyal and devoted service for the past five years. Many have died in battle, many more have suffered severe sickness. Distress is world-wide, but these people have a special claim on us. It is true that their economic advancement is essential to any great improvement in health. Besides economic advancement, however, there is needed what medicine alone can give—a real awareness of, and interest in, their problems and an effort, through medical education, to create on the spot the necessary medical services.

EUROPEAN HEALTH PROBLEMS

THE WORK OF U.N.R.R.A.

A meeting of the Royal Sanitary Institute on Dec. 5 was addressed by Dr. ANDREW TOPPING, Director of Health, European Region, United Nations Relief and Rehabilitation Administration. After giving some account of the early troubles of U.N.R.R.A. and defending it from uninformed criticisms, Dr. Topping gave a brief outline of the nutritional position in each country.

Possibility of Famine

The probability of serious malnutrition and the possibility of famine, Dr. Topping said, were the most disturbing features of the European situation. There was reasonable hope that after-war pestilence would, for the first time in history, be averted, but only food in its widest sense would avert starvation. Food reserves were meagre or non-existent almost everywhere and transport and fuel for transport in short supply. He entered one caveat, however. It was human nature for each country to picture its plight in the grimmest colours, and one must look askance at reports from any country unless checked by impartial observation. In U.N.R.R.A. they were fortunate to have Dr. Sydenstricker, of Georgia, a nutritional expert of world-wide reputation and an extremely sensible man, who went to Paris in January of this year, where he had facilities for examining adults in factories and children in schools in the poorest quarters, and his report was that there was no evidence of serious malnutrition among them and that they could go on for at least six months under the same conditions. That was at variance with the stories current at the time. Again, quite a number of countries disdained staple articles of diet which we in this country had had to put up with during the war—margarine, for example, and soya flour.

Alone of the countries overrun by Germany, Denmark had a fair prospect of adequate diet from her own resources. In Belgium the position was reasonably good, thanks to the strong measures of successive Governments and the fact that the country was small and had seaports. The Dutch people before the war were probably the best nourished in Europe, but just previous to liberation they had a severe starvation period, and it would take them some time to recover nutritional health. Norway was worse off than Holland, for it had very little agricultural land; its fishing fleet, however, had got going again. In France the official rations continued low, with less than 10 g. of animal protein daily for each person. In Italy much rickets was reported among children of poor families, but nutrition in Italy had always been on a low level.

The situation in Greece was most serious, though not nearly so bad as in 1941, when people were actually dying in the streets and nearly all the children had famine oedema. The chief difficulty was in bringing together the producing and the consuming areas; some communities were isolated. In Yugoslavia the situation was very much as in Greece, but the people were extremely self-reliant. The worst nutritional conditions were going to arise in Germany and Austria, where in some cities the present system of food distribution would not suffice to protect the population against the gradual danger of starvation. In Berlin and the Saar the present diet for the normal consumer was 1,000–1,200 calories a day. In the Saar the children were reported to be listless, pot-bellied, and markedly under weight. In the Ruhr the situation was rather better. Germany had an extremely fine agriculture, and the fertility and tidiness of the fields struck him in the early autumn, but the slave labour had now been taken away, the *Wehrmacht* had not returned to the land, and it had been laid down that the Germans must live this winter on a scale very near famine level while the food they produced had to feed the armies of occupation and displaced persons. There was no justification for the sob-stuff that "these wicked Germans are faring better than ourselves."

The Epidemic Situation

Dr. Topping next turned to the epidemic situation, repeating the statement made the previous week by Dr. George Stuart, head of the Epidemiological Intelligence Department of U.N.R.R.A., and recorded in the *Journal* of Dec. 8 (p. 809). The typhus position, he said, was the surprise of epidemiology. Typhus and starvation were concomitants of war, but while there was going to be starvation there was not going to be typhus. In October, 1943, at Naples, for the first time in the history of a typhus epidemic, it stopped suddenly before the seasonal stage at which it would ordinarily decline. This was due to D.D.T. on a large scale and the searching out of contacts and segregation of cases. In Bosnia, one of Europe's notorious epidemic foci, the American Typhus Commission had done extremely good work. Plague was causing some worry in the Mediterranean littoral. In Taranto there had been 26 cases with 12 deaths. The authorities in the Dalmatian and Greek ports were on the look-out for any extension. Typhoid fever on the Continent ordinarily ran a milder form than in Britain, but with the smashing up of water supplies a severe epidemic had occurred in Berlin, though the latest information was that it was under control. Diphtheria was the chief epidemic disease of the war, and in Germany the incidence was rising. Of a large influenza epidemic there was no sign. Tuberculosis had increased in every country, and most markedly in Greece. A mass miniature radiography examination of 500 cadets, ordinarily a healthy group of the population, revealed evidence of active or quiescent infection to nearly 20 times the extent that would be expected in this country.

Finally Dr. Topping paid a tribute to the action of local authorities in Great Britain in releasing men from their public health departments to serve in Europe. U.N.R.R.A. had 370 doctors and 435 nurses in Germany to-day. It also used, of course, so far as possible, the doctors of the different countries themselves. The Germans, when they brought in their slave labour, were careful to bring doctors with it, and so in every assemblage of displaced persons there was a reasonable number of trained or half-trained medical or nursing personnel. He made it clear that U.N.R.R.A. was not operating among the Germans in Germany, nor was it operating at present—though a demand was expected—in Austria. But it was responsible for the hard core of displaced persons, numbering some one and a half millions.

L.C.C. NURSING RECRUITMENT

The London County Council, the largest hospital authority in the English-speaking world, requires immediately 2,500 nurses and 1,600 domestic workers for its hospital service. Lord Latham, the leader of the Council, stated at a meeting at County Hall that the Council welcomed very warmly the new hospital codes recently issued under the aegis of the Minister of Health, the Secretary of State for Scotland, and the Minister of Labour. The codes were already in operation, he said, in the 87 hospitals of the L.C.C.

A recruiting centre for nurses and hospital domestic workers has been opened at County Hall. Representative staff councils are already operating in some of the hospitals, and will soon be set up generally to ensure the free expression of the views of the staffs on matters affecting working efficiency, and general well-being and comfort. Lord Latham claimed that the L.C.C. had been a pioneer in respect of many of the new proposals, notably in the employment of women orderlies to relieve the nursing staff of domestic work.

At the same meeting Mr. Reginald Stamp, chairman of the Hospitals and Medical Services Committee, mentioned that the nurses have separate room accommodation in the nurses' homes, and that notwithstanding the prevailing shortage a 96-hour fortnight is in operation in all but four of the hospitals. It is increasingly the policy to permit the nurses to live out when they wish, and it is hoped that the General Nursing Council will consider whether student

nurses, at present required to live in hospital, may not live at home while in hospital employment. The L.C.C. employs 500 male nurses, and men demobilized from the Forces are said to be joining this service in a steady flow. About 150 part-time women nurses are engaged, and the hospitals are doing what they can to enable this class of worker to carry out her hospital service while discharging her domestic obligations. The question was asked as to when the Rushcliffe salary scales would come into force, and the reply was given that this was imminent, and that the latest date would be April 1, 1946. It may be added that the L.C.C. hospitals accommodate about a quarter of a million in-patients a year ; 50,000 operations are performed annually ; 20,000 births—37% of the whole of the births in London—take place in Council hospitals and institutions; and the number of out-patients approaches one million.

LONDON COUNCIL OF SOCIAL SERVICE

The report of the London Council of Social Service for the year 1944-5 has been published from 7, Bayley Street, Bedford Square, W.C.1. It reviews the work up to the close of hostilities in Europe and outlines plans for the period of transition to peace. The report welcomes the increase of social provision by the State, which, it says, is "in tune with the spirit of the age," but it claims that statutory services need the initiative and enthusiasm of the citizen and voluntary groups, and sets out as a primary purpose of the Council the promotion of partnership at all levels between the public services and the voluntary agencies.

Surveying the everyday work of local councils of social service, the London Council's report pays tribute to their adaptability, resource, and skill in meeting the many emergencies of war, but stresses the need for an effort to rid some councils for an "odd-job mentality," and to enable them to become real centres for local study, planning, and co-operative social action. The London Council itself is rapidly developing into a centre of information and advice for individuals and organizations concerned in the promotion of community centres. The Council is convinced of the potential value of community associations and centres, but thinks that the working out in practice of a policy for their general provision will need careful guidance.

On problems relating to the welfare of old people, the Council has contact with work in 41 boroughs, of which 21 have old people's welfare committees. These committees are regularly supplied with literature relating to old people's homes, welfare schemes, and clubs, and have the advisory services of the London Council at their disposal. The Council is in touch with 47 communal restaurants managed by voluntary bodies ; 25 of these restaurants extended their services during the past year to assist men working on bomb damage repairs.

The London Council, in association with the Charity Organization Society, supervises the work of the citizens' advice bureaux in Greater London. From 1940 to the close of the European war more than one and a half million inquiries were dealt with at advice bureaux working under the Council. In the last year the number was 343,801. The report pays tribute to the men and women who came from the Provinces to help in London bureaux during the worst of the flying-bomb attacks, at which time the bureaux worked at full stretch.

PORT HEALTH SAFEGUARDS

While the International Sanitary Conventions are principally concerned with what are known as the "Convention" diseases—namely, plague, cholera, yellow fever, typhus, and smallpox—the new Convention of 1944, with an eye to the circumstances of the immediate post-war period, requires Governments to inform U.N.R.R.A. of outbreaks in their territories of other infectious disease which might constitute a menace as between different countries. It is difficult to foresee whether any epidemic disease, not being one of the "Convention" diseases) might occur in this country in proportions menacing to other countries, and the prospects of such an occurrence may be remote, but the Minister of Health has thought it well to include in the draft Port Health Amendment Regulations, 1945, a provision which would enable preventive measures to be taken in an infected port against the spread of the disease to other countries. Where the port medical officer of health finds a person to be a contact of one of the "Convention" diseases he can at present place the contact under "surveillance," by which is meant that the contact proceeds to his home or other place of destination, but that during the period of possible incubation the local M.O.H. can make inquiries as to his state of health and, if necessary, medically examine him. The new Convention allows Governments, if they think fit, to require a contact who is under surveillance himself to report periodically to the local M.O.H. In the amended Regulations the Minister has not seen his way to introduce the latter system as a measure of general application, but power is reserved by which such a requirement could be imposed at a particular port or ports with the Minister's authority. The new Convention permits of isolation as an alternative to surveillance in the case of unprotected smallpox contacts from an infected ship. A restricted provision for this is made in the draft Regulations where the port medical officer considers that there is an exceptionally serious risk of smallpox being introduced.

The regulations (and the corresponding ones for Scotland) do not involve any basic change in the general procedure of port health authorities. Vessels arriving from foreign ports, however, will have to complete a revised form of declaration of health. New provisions also affect vessels that have called at one or more United Kingdom ports. The wartime ban on the transmission by wireless of health conditions on board incoming ships has been lifted by the Admiralty, and this will help port health authorities to make prompt arrangements for preventing the spread of ship-borne infections.

Nova et Vetera

BENJAMIN RUSH, 1745–1813

"Medicine is my wife and science my mistress"

The Sydenham of America ; the American Fothergill ; the American Hippocrates ; the patron saint of American psychiatry ; the hero-physician of the Philadelphia plague ; the most distinguished physician America has produced ; the great patriot whose signature follows that of Benjamin Franklin on the Declaration of Independence ; treasurer of the U.S. Mint ; founder of the American Anti-Slavery Society—these are some of the many confused and almost legendary associations which crowd upon the commemorative mind on the two-hundredth birthday (Dec. 24) of this dynamic and picturesque personality. Each association is like a frame, large enough to hold a separate painting of the man, each a record of giant energy and often of true greatness.

The same apostolic vehemence which animated his politics dictated Rush's medical and social crusades. He raised his voice against the evils of strong drink, advocating establishments for the cure of alcoholism, urged penal reforms, and sponsored advanced education for women. He loved to tread untrodden paths, for he saw far in advance of his age. But the permanence of his fame rests essentially on his medical achievements.

A keen and accurate observer and an inveterate note-taker, Rush was one of the first to emphasize the association between infected teeth and arthritis. His descriptions of focal sepsis and of cholera infantum are among the classic texts of medicine. His excursions into psychiatry have won him the affectionate title "Father of American Psychiatry," even though his classification and theories of mental diseases, and many of his therapeutic measures, have long since grown obsolete. He gave the first comprehensive course in psychiatry in America, and his *Medical Inquiries and Observations upon the Diseases of the Mind*, published the year before his death, was the first American textbook on that subject. He stressed the value of occupational therapy, hydrotherapy, and music, and was a pioneer in the humane treatment of mental patients. Rush was one of the most ardent bleeders in the history of medicine, and ironically his death is alleged to have been hastened by injudicious bleeding. Like many men of genius he was a victim of tuberculosis.

It is difficult to come to grips with Rush's unadulterated personality, since this was compounded of so many conflicting and incongruous elements: religious zeal, culture, charm, intolerance, stubbornness, tactlessness, aggressiveness, conceit. An individualist always, he made admirers, friends, and enemies with equal ease. An elegant and forceful speaker with a beautiful voice, a magnetic teacher, and a felicitous writer delighting in classical allusions and entertaining anecdotes, like Sir James Paget he had so disciplined himself that in the buzz of household noises he could read or write with perfect concentration. Naturally dignified in appearance, with a long thin face, high forehead, aquiline nose, firm mouth, and piercing eyes beneath heavy brows, Rush dressed with fastidious care and elegance.

W. R. B.

Reports of Societies

SENSE AND SENSIBILITY IN THE TREATMENT OF CANCER

In the Section of Surgery of the Royal Society of Medicine on Dec. 5 Mr. ERNEST FINCH delivered his presidential address, which, with apologies to the shade of Jane Austen, he entitled "'Sense and Sensibility' in the Treatment of the Cancer Patient," following upon Sir Alfred Webb-Johnson's Bradshaw lecture in November, 1940, which was entitled "Pride and Prejudice."

Mr. Finch began by saying that, with the exception of cardiovascular disease, cancer was the chief cause of death in this country, the Dominions, and the United States. In England and Wales in 1941 there were 68,974 deaths from cancer, 61,814 of them being from carcinoma. Every year 7,000 women died of breast cancer. After outlining the provisions of the Cancer Act, 1939, which had passed into legislation almost unnoticed during the preoccupations of these years, he drew attention to some figures published by the Ministry of Health in 1939 showing that in a sample of 3,303 cases, 2,420 (73%) had gone untreated. It was estimated that for every proved case of cancer there were five or six sufferers. Patients were not diagnosed early enough and the treatment given—the first treatment being all-important—was not always adequate. The cancer patient should receive treatment only from physicians, surgeons, and specialists of the required degree of training and experience. Not sufficient use was made of past experience, and experiences were not pooled as they should be. One statistical inquiry had shown that between 80 and 90% of five-year cures of the disease was obtained if treatment was afforded in the early stage. The need was for a regional centralized organization. Methods of standardizing treatment by dividing cancer into various stages had proved unsuccessful; each case must be individually studied. The treatment should be assessed by the surgeon, physician, radiotherapist, and pathologist on a consultative basis, with the biochemist and biophysicist ready to afford any necessary assistance. The co-operation of the patient and his friends must also be obtained and maintained to the end. This was the ideal which he had termed "sense and sensibility."

Enlightenment of the Community

Education both of the community and of the medical profession, Mr. Finch continued, was necessary. Here he referred to the methods of propaganda and education employed in the United States and in some of the Dominions. The objection had been made to some of the public advertisements and leaflets that they were likely to create cancer-dreading neurasthenics, but figures which he showed suggested that they had been effective. One apparent result was that an increasing number of people sought the help of the diagnostic clinics on a slight suspicion of something abnormal, instead of only when the disease had reached a more advanced stage. Thus in Georgia in 1937 the proportion of those visiting the clinics who were found to have a definite malignant disease was 81.2% whereas in 1942, after these methods had begun to operate, the proportion was only 59.5%. It was claimed that in the United States as a result of the education of the community the average period of delay by the patient in consulting the doctor after noticing the first symptom had been reduced from 6.5 months in 1936 to 5.3 months in 1936–9, 4.6 months in 1939–41, and 3.2 months in 1941–4. The delay between consulting the doctor and visiting the clinic was diminishing, and as for the third frequent period of delay, that between visiting the clinic and starting treatment, 66% of the patients now began treatment within one week, and within four weeks 90% had started treatment. So far as he was aware there was only one effort of this kind made by a public health authority in this country—a leaflet by the medical officer of health for Nottingham. It was important in all such efforts not only to give information but to sustain morale. The recital of serious facts must be accompanied by hope and encouragement.

The education of the profession was also important. The student left his school with a definite picture of the final stage of cancer and a list of innocent conditions which might simulate cancer. Was it any wonder that he applied his knowledge to reassuring his patients and giving them confidence that no cancer was present? The practitioner saw relatively few cases and had little opportunity of improving his knowledge. When he saw a lump in the breast, with no fixity, no retraction of the nipple, and no palpable lymphatic nodes in the axilla his training led him to think and say that it was chronic mastitis or some relatively innocent condition. The textbooks, Mr. Finch thought, might be revised and stress early symptoms rather than late. Each case merited individual study, and they should not talk of "treating cancer" but of treating the cancer patient. The practitioner must be made an integral part of any scheme and be kept informed of the results obtained.

He then sketched plans for a system of regional and co-operating centres. The staff of such centres should be large enough to enable them to have leisure for that clear discernment and contemplation which was necessary in this field. There were at present only two main methods of treating cancer—namely, surgery and radiotherapy, though biotherapy loomed on the horizon, and it seemed likely that endocrinology would play an increasingly important part. In the regional and co-operating centres the surgeon, the radiologist, and the pathologist would meet. The regional central headquarters would, if possible, be based on a university, and towards the periphery of its area there would be the co-operation centres, each serving a population of perhaps a quarter of a million, and between these there would be surgical centres. Standards of competence were necessary for dealing with cancer, and only the profession itself could define them; by frank discussion it might reach unanimity. A pooling of experience and the dissemination of the results of research among all concerned were also essential.

PREGNANCY IN A UTERUS BICORNIS

At a meeting of the North of England Obstetrical and Gynaecological Society, which was held in Manchester on Nov. 19, Dr. R. M. CORBET reported a case of pregnancy in a uterus bicornis bicollis, the type described by Munro Kerr as "pseudo-didelphys." The patient, aged 21, first went to hospital because of dyspareunia and sterility. Examination showed a vertical midline vaginal septum reaching from the vault to within a short distance of the introitus. The right vagina was larger than the left. Two uterine bodies could be palpated bimanually, and at the top of the right vagina there was a cervix, but lack of dilatation prevented adequate examination of the left vagina. Removal of the septum and salpingorrhaphy were recommended, but the patient did not return to the hospital until she was pregnant. This occurred in the right horn. She was admitted to hospital with cramp-like pains and bled three weeks before she was due; the same night a decidual cast was expelled from the non-pregnant horn; no contractions of the pregnant horn could be felt. She was discharged, but ten days later was readmitted in labour and in five hours gave birth to a living female child of 5¼ lb. There was no obstruction by the non-pregnant horn or post-partum haemorrhage, most common complications of this condition. This case showed that the horns of a uterus "pseudo-didelphys" could act independently, and suggested that the onset of labour could not entirely be due to a change in the hormone balance.

The annual meeting of the Midland Tuberculosis Group was held in Birmingham on Nov. 24, when 20 members were present. It was decided that meetings should be held bi-monthly on Saturdays at 3.15 p.m. and that invitations should be sent widely in order to extend the basis of the Group. Drs. J. E. Geddes and S. Deaner were elected president and secretary respectively.

The second meeting of the Italian Society of Tropical Medicine and Hygiene will be held in Asmara early in 1946, with the aim of letting Eritrean doctors, veterinarians, and biologists make contact with their colleagues of neighbouring countries and discuss scientific matters. The meeting will last 4 or 5 days. All Italian and foreign colleagues are invited.

Correspondence

Tropical Medicine

SIR,—In his presidential address to the Royal Society of Tropical Medicine and Hygiene, as reported in the *Journal* of Dec. 1 (p. 774), Dr. C. M. Wenyon has rightly expressed great concern about the provision of facilities for dealing with tropical diseases and the teaching of tropical medicine in the future. He suggests that the re-establishment in London of a tropical medical centre "would restore the position formerly held by this country in the field of tropical medicine, would be a monument to the many pioneers who devoted themselves to the study of tropical diseases, and would be a centre of tropical medical activity worthy of the British Empire."

We believe that Dr. Wenyon has understated the case. The time has come for the development of a scheme of national and imperial conception which would envisage the establishment of tropical medical centres not only in London but wherever they are most urgently needed and can be maintained. One of the most immediate needs in this country is adequate accommodation for sick persons coming from the Tropics. The establishment of a tropical medical centre in London would not, in our view, solve the problem. While, unhappily, the facilities for dealing with tropical diseases in London have declined during the war, as stated by Dr. Wenyon, those in Liverpool have been considerably expanded and continue to flourish vigorously. Since the outbreak of war the staff of the Liverpool School of Tropical Medicine have treated over 5,000 in-patient and 12,000 out-patient cases of tropical disease, and concurrently have engaged in an active research and teaching programme.

Personal experience in dealing with such large numbers of patients has taught us that a disadvantage of their concentration in a single centre—i.e., that in Liverpool—has been the enormous area (virtually the whole country) that has had to be served. We are convinced that centralization of such clinical facilities in Liverpool, in London, or in any other single locality in peacetime would be impracticable and not in the best interests of the patients. Dr. Wenyon's plea for the establishment in London of a tropical medical centre as the means of forwarding the best interests and the fame of British tropical medical activity does not, therefore, go far enough. The vitally important matter of providing proper accommodation for cases of tropical diseases in this country must not be settled without taking into consideration such matters as the localization of mercantile and tropical interests in Britain. Such interests are centred mainly about the great ports, and in this respect Liverpool, which is the terminus and home of a very considerable volume of traffic and of trade with the Tropics, shares with other ports the importance of London. Tropical medicine is at present taught in both Liverpool and Edinburgh, as well as London, and we consider that when hospital medical centres are developed in Britain they should be built up in the first instance about these schools, so that each could play its part in the advancement of tropical medicine and the training of personnel for the Colonial and other medical services and for the staffing of the Colonial universities proposed in the Asquith report.

An imperial scheme for the furtherance of tropical medicine in all its bearings—the treatment of cases in this country, planning and teaching with a view to the treatment of indigenous peoples, fundamental research, etc.—can only be truly representative and worthy of our national responsibilities and opportunities if it takes the above facts into account.—We are, etc.,

A. R. D. ADAMS. R. M. GORDON.
T. H. DAVEY. E. M. LOURIE.
B. G. MAEGRAITH.

School of Tropical Medicine, Liverpool.

Medical Future of the Colonies

SIR,—Much credit is due for your objective and well-informed leading article on the medical future of the Colonies (Nov. 17, p. 693). It would be a pity if what ought to serve to open the eyes of the Mother Country to the physical conditions of colonial peoples should, in the event, merely arouse sectarian feelings, as seems to be the case in the correspondence columns of the Dec. 1 issue (p. 781).

I am myself a West African. I have just returned from a five-months tour of British West Africa under the auspices of the Colonial Office and as the guest of the West African Governments, in the course of which I covered pretty thoroughly as much of the four Colonies as could be done by ship, ferry, rail, aeroplane, and motor car. Everywhere I paid particular attention to health conditions and medical facilities.

No one who has the courage to face the facts will deny that the statements contained in your leader are correct, and, what is perhaps more to the point, balanced. Least of all is there any disposition in Government circles to shirk the issue. The responsible officials are alive to the situation and need encouragement. The fact is that the problems are immense and extremely complex, embracing as they do not only the provision of hospitals and medical personnel, but agricultural, economic, educational, and political considerations. I am afraid your statement in the last paragraph that "these reforms are suggested only for European medical officers" reveals a fundamental weakness in what is otherwise a useful presentation of suggestions widely accepted. No one who knows the Colonies to-day openly admits to a dichotomy as between European and non-European medical officers. In fact, of course, in West Africa the Colonial Medical Service is restricted to Europeans, and Africans, when there are vacancies, are appointed as medical officers special to each Colony. But this is a state of things against which so much determined and continued protest has been made that a commission has been appointed to inquire into the whole range of conditions of service of Africans and Europeans in the entire Civil Service, including the medical departments. Personally I shall be extremely surprised if the service is not unified as a result. The health problems of the Colonial Empire cannot properly be tackled by Britain *for* the Colonies. This is not only impracticable but cuts against British political philosophy. It can only be done by the Colonies *with* the sympathetic assistance of Britain.

The number of doctors needed to staff anything approaching a well-run service is so high that it cannot possibly be met by doctors recruited from Britain, especially in view of the needs of the British people. On the other hand, although for about eighty years West Africans have been coming to Europe to qualify in medicine (a great-uncle of mine did this at Oxford in the 1870's), yet it costs about £2,000 for each one to spend the necessary six or seven years in training in this country for the purpose. The result is that in all British West Africa to-day (population of 25 millions) there are some 200 African and 200 European doctors, all with British qualifications and on the *Register* of the General Medical Council.

Obviously two steps are urgently necessary—namely, to produce a large number of properly trained general practitioners in the near future to man the Government medical stations, and, at the same time, to train a minority of consultants in Europe. Steps are being taken in both these directions. The Gold Coast for about five years has been giving a small number of free medical scholarships tenable in England, while there are about eighty other private medical students from the other three Colonies at present in England distributed in the various medical schools. Within the next two or three years it is proposed to establish a West African University at Ibadan in Nigeria, at which, among other things, a complete medical training recognized by the G.M.C. and leading to the degrees of London University will be provided.

Specialists will have to be trained in Europe, however, not only for the consultant section of the service but also to provide part at least of the teaching personnel of the university. The present suggestion of the Asquith Commission is for the staff from professors down to be sent out from Britain on special terms. This will meet a great need, serve to maintain a high standard, and also to retain contact with the progressive traditions of Britain. At the same time there are a number of African youth of both sexes in this country who for some years have been undertaking, at their own expense, extensive postgraduate training and qualification in medicine, surgery, midwifery and gynaecology, child health, psychological medicine, ophthalmology, physiology, and anatomy, and responsible opinion naturally expects that they will be given opportunity to serve their country in senior posts.—I am, etc.,

Newcastle-upon-Tyne. R. B. WELLESLEY COLE.

"Geomedicine"

SIR,—As a practitioner living in a subtropical country I read with the greatest interest Dr. Macdonald Critchley's Croonian Lectures on "Problems of Naval Warfare under Climatic Extremes" published in the *Journals* of Aug. 4, 11, and 18. The author is certainly right in his assumption that hot climate is not the sole cause of the manifold symptoms described as "tropical neurosis." Two questions as posed by him require elucidation: (1) whether the same psychiatric features occur in tropical civilians whose homes and families are on the spot; and (2) whether meteorological and clinical fluctuations run parallel. Now from my experience in Palestine I would not hesitate to answer the first question in the negative and the second in the affirmative.

This country represents perhaps the biggest laboratory for studies concerning adaptation of white people to new climatic and environmental conditions. Palestine is situated in the warm temperate ("subtropical") zone and has many climatic and geographical peculiarities—e.g., hot and humid inland valleys, dry and arid plateaux, hills of 3,000 ft., and a unique depression of 1,200 ft. under sea level. It has furthermore an immigrant population of about half a million, born and brought up in Europe, who have to live and to do hard manual work under climatic and social conditions (changing from urban life and mercantile or professional occupations to farming, fruit-growing, fishing, factory work, etc.) to which they are entirely unused. It is obvious that individuals living for a specified period in tropical or subtropical regions as civil servants or soldiers, without the comfort of home and family life, without any liking for the country and the job they are doing, are apt to develop nostalgic reactions and suffer from neuroses. The same does not apply to settlers, who come to a new country of their own will, desirous to begin a new life and to make the most of it. They will probably suffer sometimes from heat or moisture or from dry desert winds, but not from psychic disturbances. A central Academy of Geomedicine or Climatology as suggested by Dr. Critchley, "wherein all research—medical and scientific—could be undertaken," may prove a most important instrument for studying the problems of settlement of the white races in colonial territories of the Empire and the Dominions situated in hot zones. These problems are certainly vital, not only for the British Empire, but for other countries—including mine—which are dealing with immigrants of European origin.—I am, etc.,

J. SEIDE,
Medical Superintendent.

Rothschild Hospital, Haifa.

Losses of Polish Medicine

SIR,—In connexion with the appeal for medical books for Poland published in the *Journal* of Nov. 10 (p. 676) by the Polish Medical Association in Great Britain, I should be very grateful to you if you could publish the following official information which has just reached me from Dr. Stanislas Konopka, Director of the Department of Science and Publications of the Ministry of Health in Warsaw. This information concerns the material and cultural losses suffered by Polish medicine during the war years.

"The war twice fought on Polish territory and the occupation of Poland during the years 1939–45 brought destruction to every field of cultural and economic life. The cultural losses must be placed first in importance because in the majority of cases the losses are irretrievable, considering the losses of museum collections, archives, and libraries. According to provisional estimate, as far as Polish medicine is concerned, Poland has been deprived of 70% of the equipment of scientific institutes, laboratories, clinics, and hospitals; in Warsaw the buildings too have been destroyed. Eighty per cent. of the medical libraries and museum collections in Warsaw have been destroyed or burnt.

"Before the war the main sources from which Polish doctors derived their professional and scientific knowledge were the university libraries and the special medical libraries. To the greatest Polish libraries belonged the Library of the Warsaw Medical Association, founded in 1820, which contained 67,000 books and medical papers, among them valuable prints from the sixteenth to eighteenth centuries. The second, although much larger library, founded in 1921, was the library of the Military Medical Training Centre. This library was a most active one; it comprised 115,000 volumes, was lending books all over Poland, and possessed a department of bibliography, sending on request bibliographies from every field of medicine and publishing Polish medical bibliography. The annual turnover was fifty to sixty thousand books. Besides these two libraries there existed many smaller ones, such as the library of the Chirurgical Society, Gynaecological Society, Society of Hygiene, etc., and libraries of university clinics and institutes. Of all these libraries only the ruins remain to-day. In Cracow and in one or two other provincial centres the libraries have been partially saved. In Warsaw, however, only the libraries of the ophthalmic, paediatric, and gynaecological clinics have been, to some extent, preserved. Altogether Warsaw lost irretrievably, mainly through fire, twenty-one medical libraries comprising over 550,000 volumes. There is no trace left of the rich museum of the history of medicine. It possessed over 16,000 items, such as old medical instruments, medals, paintings, and valuable collections of old medical documents, manuscripts and prints.

"Many of the Polish publications, even of the most recent date, have perished, and they will be considered as rare books. During the fighting in Warsaw all the publishing firms and their stocks were lost. This loss is all the more painful as Warsaw was the main publishing centre of medical and scientific books. Only a few private libraries belonging to medical men remain.

"This great dearth of Polish medical books has been increased through the German order, published in 1939, forbidding the publication of any Polish books or papers, including all medical books. The Germans, as is well known, also closed all universities. The German doctor for the City of Warsaw, Dr. Schrempf, published an order—*die wissenschaftliche Arbeit wird streng gestraft*. The Germans saw that this order was strictly enforced by imprisoning many Polish doctors and scientists or putting them into concentration camps from which only 10% came back. The losses in medical personnel will be realized by comparing the number of doctors practising before the war in Poland—14,000—with the number of doctors registered at present—6,800.

"Before the war there were appearing 75 to 82 medical periodicals and journals; practically all the stocks of these have been destroyed. During the war their publication was forbidden and, needless to say, Poland was deprived of access to all foreign medical publications. The only professional medical paper which was appearing in Cracow during the German occupation, and published in Polish, was a paper giving information about the new German sanitary orders and regulations.

"In spite of all the persecutions and destruction brought about by the occupation and fighting the Polish doctors have not given in to despair. Scientific institutes, laboratories, and libraries are being rebuilt and organized. Medical schools in Warsaw, Cracow, Posnan, Lublin, Lodz, and Wroclaw have once more started to function. A new medical school in Gdansk has been established. Through the initiative of the Ministry of Health the main medical library has been restarted and a net of medical libraries in other Polish towns. The publication of medical books has revived. In Warsaw the Medical Institute of Science and Publications has been opened. Its main purpose is the printing of medical books and textbooks. Polish medicine, which is well known through the names of Sniadecki, Dietl, Neusser, Bieganski, Mikulicz-Radecki, Babinski, Cybulski, Popielski, Dogiel, Danysz, Nencki, Szymonowicz, Teichman, Curie-Sklodowska, and others, wants to take part again in the progress of medical science. Without, however, the re-establishment of ties with Anglo-Saxon scientists and writings as well as with other nations—French, Russian, Scandinavian—it is impossible to start further work.

"Polish medical men and scientists appeal to their colleagues abroad for help in the re-equipment of libraries with books and periodicals. To facilitate and co-ordinate the help given medical committees for scientific help for Poland have been set up in New York, Moscow, Paris, Stockholm, and Zürich. In London the work is centred in the Polish Medical Association."

—I am., etc.,

LEON DMOCHOWSKI.

Imperial Cancer Research Fund,
Mill Hill, N.W.7.

Glandular Fever and Infectious Mononucleosis

SIR,—Dr. T. S. Eimerl (Nov. 24, p. 743) is somewhat hard on Dr. Gerald Slot and Major F. D. Hart in his criticisms of their article on glandular fever with neutropenia. Dr. F. Muller has already pointed out (Nov. 17, p. 702) that the occurrence of neutropenia has long been recognized, and indeed, it is by no means uncommon in cases clinically severe. But Slot and Hart were over-seas, we believe, at the time and had only limited access to the literature.

Dr. Eimerl is surprisingly astray on his principal point. He states: "The two terms"—namely, infectious mononucleosis and glandular fever—"are by no means synonymous and should not be used in that manner." They are, in fact, used strictly synonymously. When Sprunt and Evans published their cases of infectious mononucleosis in 1920 they were unaware that

there was any connexion with Pfeiffer's *drusenfieber*. When we published our cases in this country a few weeks later (*B.M.J.*, 1921, **1**, 100) it was as a feature of glandular fever. When the proofs of our article were in our hands we read the communication of Sprunt and Evans for the first time, and could only insert an indication that we believed it referred to the same entity. The result has been that in America the term "infectious mononucleosis" is used invariably and solely, while in Britain both terms are in use as synonyms, glandular fever being more commonly but not invariably employed. On the Continent "glandular fever" is often applied to the disease in children and "infectious mononucleosis" to the disease in adolescents and adults, but the identity of the two forms is accepted. Anyone who reads the literature under the impression that glandular fever and infectious mononucleosis are different conditions will arrive at an unfortunate state of confusion.—We are, etc.,

HENRY TIDY.
E. B. MORLEY.

London, W.1.

Anaesthetic Risks

SIR,—We have read the letter of Dr. E. Falkner Hill (Nov. 24, p. 746) and feel that his assertions are unjustifiably sweeping. He compares alcohol with ether and chloroform and argues that general anaesthesia is undesirable because changes in the cerebral cells can be demonstrated in chronic alcoholics. We might perhaps define a chronic alcoholic as one who drinks to excess more or less daily over a number of years. On the other hand it must be extraordinarily rare for a patient to have more than a score of general anaesthetics throughout a lifetime.

For our part, having due regard purely to the after-effects, we would prefer a skilfully given general anaesthetic rather than suffer the "hang-over" associated with alcoholic over-indulgence. Perhaps the greatest advance in anaesthesia is that, having more drugs at our disposal—such as the short-acting barbiturates, cyclopropane, N_2O, etc.—we are able to administer anaesthesia with minimal after-effects. It is rare to find patients complaining of headache, nausea, and vomiting following the use of the above-mentioned drugs. On the other hand these symptoms appear to be common if we study the condition of those who fail to temper enthusiasm with discretion where alcohol is concerned.

Dr. Falkner Hill also states: "Anaesthesia is generally supposed to be due to a process of suboxidation" and that "the anaesthetic, like Horatius, holds the bridge between the outside of the cell and the inside." Admittedly this is the generally accepted theory, but it may be, however, that cell activity is diminished to such an extent that the O_2 requirements are extremely small. If the latter view is accepted there is only a relative suboxidation due to the diminished requirements of the cell, and as such is surely unlikely to cause any cell damage.—We are, etc.,

D. C. DEVITT.
M. V. H. DENTON.

Mount Vernon Hospital, Northwood.

Acute Yellow Atrophy after Trilene Anaesthesia

SIR,—I have been most interested in Major K. N. A. Herdman's report (Nov. 17, p. 689), and the subsequent letters by Drs. Philip Ayre and Clifford Wilson (Dec. 1, p. 784). Dr. Ayre attempts to incriminate pentothal by quoting Adriani (*The Pharmacology of Anaesthetic Drugs*, 1942) and Langton Hewer's *Recent Advances in Anaesthesia* (p. 128). On referring to the latter I find that Langton Hewer refers to "Reynolds, C., *et al.*, *Anesth. & Analges.*, 1938, Nov.-Dec., p. 357" and "Vaizey, J. M., *Brit. J. Anaesth.*, 1938, Jan., p. 55" in his reference to the toxic effects of pentothal on the liver. These reports were published when pentothal anaesthesia was in its infancy, and a great deal of research and clinical investigation has been carried out since then, and later work tends to prove that pentothal does not produce any liver damage.

Kenneth Heard of Toronto writes in *Anesthesiology* (Sept., 1944, **5**, 450): "Damage to the liver would seem to be one danger signal, since it is apparently accepted that pentothal is broken down, at least to a certain degree, in that organ. Clinically, we have *not* found that to be the case"; and further: "We have seen no post-operative complications which appeared attributable to the pentothal, even in deeply jaundiced patients." R. Charles Adams in *Intravenous Anaesthesia* (1944, p. 474) writes: "It appears to be doubtful that the intravenous administration of a thiobarbiturate, such as pentothal sodium, for anaesthetic purposes, causes any appreciable damage to the liver or increases damage already present." Later experiments still are quoted by Masson and Beland in *Anesthesiology* (Sept., 1945, **6**, 490). They class pentothal among the barbiturates that are "possibly detoxicated in all the tissues of the body but not to any great extent in liver or kidney."

From my own experience and from the above quotations I do not think the 0.8 g. of pentothal given in Major Herdman's case could have caused the liver damage and that some other cause should be sought. Dr. Wilson's idea of homologous serum jaundice seems a very possible explanation if plasma or serum had been administered. My main concern in this letter is to exonerate pentothal from being considered a possible cause of the liver damage.—I am, etc.,

A. HUGH MUSGROVE.

Cardiff.

Spinal Analgesia

SIR,—I read with much interest the article by Mr. W. A. Fairclough (Dec. 8, p. 801) concerning sixth nerve paresis as a complication of spinal analgesia. I have advocated and given spinal analgesics in suitable cases for many years, and stressed their value in a Hunterian Lecture in 1929 (*Lancet*, **1**, 375). I have notes of three cases of ocular palsies and one of permanent incontinence of urine which afflicted a man with an inoperable carcinoma of the rectum. At that time I used concentrated solutions of various kinds, and I note that spinal percaine 1/200 was used in the ten cases reported by Mr. Fairclough.

For the past five years or so I have only injected intrathecally spinal percaine 1/1,500, and have had no ill effects. The solution is of a lighter specific gravity than that of the cerebro-spinal fluid, so the patient is tilted with the head downwards, which also assists in counteracting shock. Fourteen c.cm. is adequate and safe for upper abdominal operations, 8 or 10 c.cm. for appendicectomy or a hernia, and 3 c.cm. for an infant's intussusception. I am of the opinion that a dilute solution suffuses along the dural sheath more readily than does a concentrated preparation, and is less likely to be absorbed rapidly with toxic effects or to cause complications by over-action on a single spinal nerve or localized area of the spinal cord.—I am, etc.,

R. J. MCNEILL LOVE.

London, W.1.

SIR,—May I add to Mr. W. A. Fairclough's ten cases of abducens paralysis following spinal anaesthesia (Dec. 8, p. 801) three other cases originating in the same way which I came across in the last few years.

The first was of a man who had suffered from enuresis and impotence since having a cystoscopy under a spinal analgesic. He was certainly not a neurotic type and I believe his complaint was genuine. Next came a patient with the story that he had never been able to pass a decent motion since being operated on for piles. I expected to find a stricture, but instead discovered that he had a lax sphincter and a ballooned rectum, on which straining produced no effect. "Had he been put to sleep or . . . ?" "No, he had had a needle in the back." The last patient gave a similar history, and volunteered the information that he had to use a finger to get any evacuation at all. The findings were the same as in the previous case.

Unfortunately I had no means of knowing what drug was used or how it was administered, but I have no reason to suppose that there was any departure from routine. And this makes the matter more serious than it might otherwise be, though it was serious enough already in all conscience that three young men should be so disabled. We can guard against introducing infection into the spinal canal or damaging the intervertebral disks with the tip of our needle, but how can we avoid sequelae which we do not often know about, much less understand?

I have heard of similar cases from colleagues and believe them to be not uncommon. Common or not, they deserve ventilation.—I am, etc.,

STEPHEN POWER.

London, W.1.

Spinal Analgesia in Operative Obstetrics

SIR,—The value of Dr. Louis Resnick's article on spinal analgesia in operative obstetrics (Nov. 24, p. 722) would have been enhanced had he indicated that this technique was the optimum procedure in each individual case of his series. The safety factor is of prime consideration in the choice of any anaesthetic technique, and it is recognized that the choice of spinal analgesia is justified on this score in many cases.

If, however, the article in question be interpreted as an invitation to obstetricians to discard other anaesthetic agents in preference to spinal block, further convincing argument is necessary. If it merely seeks to demonstrate what can be done by spinal analgesia one must thank the author for his efforts and extend one's thanks to those patients who might have been better served by other means but who furnished the material for the demonstration.—I am, etc.,

Salisbury. A. D. H. SIMPSON.

Crooke-Mellgren Cells

SIR,—I note in the *Medical Annual* for 1945 (Wright, Bristol) that, under the section on the pituitary gland, Langdon-Brown and Simpson describe the changes in the basophil cell of the pituitary gland in Cushing's syndrome as the "basophilism changes of Crooke and Mellgren." The changes which they ascribe to Mellgren (1942) were demonstrated in detail by me at a meeting of the Pathological Society at Glasgow in 1941 and frequently mentioned by me in correspondence with other pathologists, including Crooke and Russell. Publication was delayed until I had devised special methods for reproducing photographically the abnormality ascribed to Mellgren. My manuscript was submitted in 1942 and published in 1944 (*J. Endocrinol.*, 1944, **3**, 323), the delay being caused by difficulties in securing colour printing in wartime. The date of submission is recorded in the journal.

I am writing this in the interest of accuracy and because the description of the abnormalities which the writers ascribe to Mellgren was claimed (rightly) by me as original observations in my M.D. thesis (Glasgow University, 1944) and at the Manchester meeting of the Pathological Society in 1943, where I demonstrated the special staining techniques. I have not referred to Mellgren in any of my written work or demonstration as his contribution was unknown to me. It is unfortunate that the writers do not state what Mellgren interpreted the changes as representing, for this is the crux of the problem and is dealt with extensively in my papers.

A somewhat similar situation through wartime difficulties of publishing arose in connexion with alloxan diabetes. By the time the paper from Glasgow was published announcing the production of islet necrosis with alloxan, Glasgow workers had completed the examination of diabetic rats and rabbits up to sixty days' duration, and colleagues had demonstrated similar effects of alloxan on the mouse and dog. Nevertheless the production of diabetics with alloxan first appeared by the hand of American workers, and the claim of the originators was somewhat obscured by references to an earlier work on alloxan by an American chemist who had injected alloxan into animals and studied their blood-sugar curves. While the true facts are generally known in such cases by scientific workers, the medical reviewer is sometimes more concerned with chronological order of publication than with the well-documented and illustrated publications of more worthy contributors. This is especially so on the other side of the Atlantic, where the reviewer's data are often obtained from collected summaries rather than from the original papers.—I am, etc.,

N. G. B. MCLETCHIE, Major,
Bangalore, India. Evacuation and Distribution Staff Officer.

Galvanic Stimulation of Denervated Muscle

SIR,—The letter of Prof. H. J. Seddon and his co-workers (Nov. 24, p. 745) with its additional reasoning as to the value of galvanism in the treatment of denervated muscle will be read with great interest.

My doubts on this subject arose during the observation of an assemblage of peripheral nerve lesions in which galvanism was employed in the treatment of denervated muscle. Progress was estimated by the method of Tinel, by the elicitation of formication on percussion over the lower limit of the advancing axons. By serial observations at monthly intervals a fairly accurate estimation of the rate of regeneration could thus be obtained. It so happened that one of these patients, in whom regular gradual regeneration was taking place, sustained a fracture of another limb, and was absent from the treatment of his nerve lesion for a number of weeks. On his return examination by Tinel's method showed the unexpected result that the rate of regeneration had been considerably more rapid during the absence of galvanic stimulation. In several other cases the treatment was interrupted by some extraneous circumstance, and in every instance the records showed an acceleration of the rate of recovery during the absence of galvanism. It should be said that these observations were not planned for the purpose, but were due to chance events during the course of treatment; and also that the records appeared to show that galvanism did not prevent regeneration, but slowed down its rate; and also that there was no evidence that the final result was impaired. Though in no way conclusive, these results appear to merit further consideration.

To give a further instance, in facial paralysis an extremely slow and gradual process of recovery sometimes persists for a considerable period. In several of such cases the effect of stopping galvanic treatment has been tried, and in each such case there has been an apparent acceleration of the rate of recovery, as judged by ordinary clinical examination, the quantitative estimation by Tinel's method not being here available.

In the endeavour to find a hypothetical explanation of these results the different stages must be taken into account. During the re-establishment of the motor end-plates by the delicate terminations of nerve fibres, the katabolic changes induced by powerful and repeated galvanic contractions may well be detrimental; there is here a contrast with the natural process of recovery, in which the gradual increase in the strength of the voluntary contractions is proportioned to the stage of regeneration, the neuromuscular mechanism being thus nursed into recovery. At an earlier stage, when the nerve fibres at a higher level are undergoing regeneration, vigorous galvanic stimulation may exercise an unfavourable influence owing to the repeated movements and disturbance of tendons and muscles in the neighbourhood of the nerve trunk. Finally, long-continued galvanism may cause pain and redness of the skin, and it is believed to cause ionization of deeper tissues; this long-continued irritation may well be inimical to a slow and difficult reparative process. Here arises the question of contractures. It is generally agreed that under ordinary circumstances denervated muscle does not undergo contracture; on the contrary, it tends to elongate (Volkmann's ischaemic contracture is in a different category, and the so-called secondary contracture in facial paralysis is in reality a semi-voluntary contraction of muscles which have partly or wholly regained voluntary power). Though not in accordance with the general experience, Dr. R. E. M. Bowden (Oct. 13, p. 487) states that contracture may occur in paralysed muscle, either early or late in the course of denervation, and gives directions for its prevention. Presumably these cases had been treated by the exceptionally intensive galvanism recommended by Prof. Seddon, and the changes thus set up in the muscle had led to contracture. Further information would here be of interest.

Great interest attaches to Prof. Seddon's exact analysis of problems which usually receive only clinical study, and it may well be hoped that his researches will throw light on the more general aspects of nerve regeneration in addition to those concerning the muscles.—I am, etc.,

Sheffield. R. G. ABERCROMBIE.

Midwife's Responsibility in Placenta Praevia

SIR,—Should the midwife make a vaginal examination in cases of placenta praevia? The treatment of placenta praevia has passed through many different phases: version and extraction, total detachment of the placenta, artificial rupture of the membranes, bipolar version, vaginal packing, metreurysis, Caesarean section, Willett's forceps. Nowadays hospital treatment of all such cases is advocated. It is now almost axiomatic that no vaginal examination should be made before the patient is admitted to hospital. In hospital vaginal examination is performed only after all preparations have been made for any treatment which may be required, either by the vaginal or abdominal route. Such is common medical teaching.

In skilled hands, with suitable use of blood transfusion, maternal results may be good and not vary much, irrespective of the method employed. This is not so with foetal results. It is now clear that when active measures are necessary the best foetal results are obtained either by artificial rupture of the membranes alone or by Caesarean section. In order still further to reduce the foetal mortality it is now suggested, in the report of a meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine (Dec. 1, p. 779), that the patient need not necessarily receive active treatment on the first haemorrhage, and a period of expectancy is advocated to lessen the incidence of prematurity.

Where team work is required it is important for all members of the team to be adequately and suitably instructed in what is required of them. It is my submission that there is a note of uncertainty in the midwife's instruction. As she frequently sees the patient first hers is a great responsibility. Should she make a vaginal examination? Generally speaking she should not, and is so instructed. If the patient is bleeding when she arrives what is she to do? Her textbooks even advocate her rupturing the membranes if the patient is bleeding and if she cannot get a doctor. Should she not be told to empty the urinary bladder by catheter, apply abdominal pads and binder, keep the patient warm and give a sedative; that if she does nothing more *the bleeding will stop*? The patient can have a transfusion when medical help is eventually obtained, after which she can be removed to hospital.

Some examiners at the Central Midwives Board examinations expect candidates to say that *they* (the candidates) would rupture the membranes themselves if the patient continued to bleed and if the doctor summoned failed to arrive. By attempting to do this, however, the midwife is likely merely to provoke an increase of haemorrhage. A midwife "snowed up," and likely to remain so for a week, in a cottage with a bleeding patient might be forced to undertake active treatment herself. But such circumstances are rare, and they should not be allowed to obscure the plan of action to be followed in more usual circumstances.

Not only are pupil midwives perplexed as to how they should answer their examiners, but the sister tutors too are in doubt about the best instruction to give them. Those pupil midwives will retain their uncertainty even when they pass their examination. When they meet antepartum haemorrhage in real practice they will still be uncertain how to act. Now their uncertainty will constitute a maternal danger. In new and laudable efforts to improve the foetal mortality let us not overlook this standing maternal danger.

Are pupil midwives in their training schools ever allowed under supervision to rupture the membranes in cases of placenta praevia? I doubt it. Why, then, tell them to do by themselves out of hospital what they are not allowed to do in hospital even under expert supervision?—I am, etc.,

North Middlesex County Hospital, N.18. ANTHONY W. PURDIE.

Treatment of Varicose Ulcers

SIR,—Dr. R. K. Brooks's letter (Dec. 8, p. 816) on the above subject advocates the application of certain creams and ointments to chronic varicose ulcers. He claims good results on a "fair number of cases." I suggest that the pathology of the complaint is ignored, and that the only placebo he offers to the gravitational causation of varicose ulceration is to tell his patients to elevate the limbs for a couple of hours every day. I claim that if his treatment is followed the varicose ulcer patient will be with us for yet another generation. It matters not what medicament is plastered on to a varicose ulcer: the cause must be treated. Failure to treat this cause means constant recurrences of ulceration.

All cases of varicose ulceration require compression treatment. This may be obtained in various ways, and if Dr. Brooks does not like the "elastoplast" technique there are many others. The two-way-stretch bandage is valuable for most cases, but there are many other types. All cases of ulceration need surgical treatment to the incompetent superficial venous circulation, provided the deep veins are in good condition.

If Dr. Brooks were to attend a clinic dealing with vast numbers of varicose ulcers I feel sure he would appreciate my anxiety lest his views were to be adopted. Dickson Wright has done the profession untold good in preaching the true pathology of the gravitational ulcer, which, with proper treatment, can be made a rarity instead of a weighty economic problem.—I am, etc.,

London, W.1. R. R. FOOTE.

SIR,—Having read Dr. R. K. Brooks's letter on his methods of treating what appears to be no more than a complication of hypostasis, I find no mention of varicose veins, which could hardly be absent in a limb with varicose ulcers. It is my opinion, based on my own cases and on the follow-up of a considerable number of others treated elsewhere on similar principles, that ulcers due to varicose veins will invariably clear up if the cause is effectively dealt with, even without local treatment or elevating the leg. Dr. Muldavin (Dec. 8, p. 816) describes very clearly the principles of treatment to which I refer. Treatment on these lines would seem to offer not only a more rapid cure but one which is usually permanent.

While local treatment may be effective in clearing up ulcers and eczema in the elevated leg, surely this is produced by the diminished hypostasis, due to the position of the limb rather than to any substances applied locally. Ulcers invariably recur when the patient resumes his former existence, spending more time in the erect position. One not uncommon exception to this is the occurrence of a coincident phlebitis, which gives a longer temporary cure but relapses when the tributaries become dilated and incompetent, or the original vein becomes recanalized.

Cure may also be obtained by applying to the limb pressure sufficient to render the veins harmless by flattening—i.e., "elastoplast." Relapse may be avoided by the continuance of pressure—i.e., crêpe bandage. The advantages of pressure treatment over postural in patients who are too old for surgical measures are that it is ambulatory throughout and does not require postures which are liable to embarrass the senile cardiovascular system.—I am, etc.,

Hayle. P. L. RENOUF.

Artificial Pneumothorax Refill

SIR,—As an "old hand" at artificial pneumothorax I well recall the methods employed in 1918—namely, the anxiety about knowing the pressure within the thorax, the giving of a local analgesic, and the slow running in of the gas. Over a quarter of a century ago Parry Morgan had devised an apparatus whereby the mean pressure could be known the whole time gas was running. This apparatus we gave up in 1920. Fifteen or sixteen years ago there was marketed the Peter Edwards pneumothorax needle and stopcock, which cover all the suggestions made in letters. As to a local analgesic, this has been given up for twenty-five years because people prefer both their induction and the refills without it.

I would like to register my disapproval of the method suggested for refills by most of your correspondents. It is my opinion that to push the needle straight forward without stopping is not good practice. At a refill one should learn to sense the pleura, and in order to do this digital pressure in the intercostal area is desirable, and a firm pressure with the needle, note that one is through skin, through the other layers, and "sense" the pleura. By doing this one is so much happier at an induction because one knows when the pleura is encountered. There does not appear to be any reason for knowing the mean pressure as the air is going in. A rough rule would be to run in—at as high a pressure as one's apparatus will permit and as quickly as one likes—half of the quantity of air taken at the last refill. Take the reading and continue until the pressures are at their optimum.—I am, etc.,

Cheshire Joint Sanatorium, Market Drayton. PETER W. EDWARDS.

SIR,—We have followed the correspondence on this subject with much interest and many misgivings. It appears to us that there are but two considerations—that the operation should be safe and that it should be as nearly painless as possible. The greatest danger is undoubtedly that of producing air embolism, an occurrence best prevented by using a type of apparatus that allows a manometric reading to be obtained throughout the instillation of air. Incidentally, if the Lillingston-Pearson machine is used a swing may be obtained during the whole

procedure if the manometer is left in the circuit. Thus the use of so cumbrous a needle as that described by Dr. Alastair Allan (Nov. 3, p. 607) or of the elaborate feat of digital dexterity practised by Dr. W. H. Tattersall (Dec. 1, p. 783) may be avoided. Before leaving this aspect of the subject we would utter a word of warning against the manœuvre described by Dr. Paton Philip (Dec. 8, p. 821). While it is admittedly easy to insert the refill needle accurately into the pleural cavity during expiration, with the lung deflated, the dangers of lung puncture and of embolism return with full force as the lung re-expands during inspiration towards the point of the needle, especially if this is of the fine, sharp Morland pattern—a type that we never use.

We are in complete agreement with those of your correspondents who oppose the use of a local analgesic—a practice which very seldom contributes to the patient's comfort yet always adds to his hazards. The chances of sepsis, admittedly small in this connexion but nevertheless present on every occasion when the body surface is punctured, are doubled when two needles have to be introduced. As Dalgleish (Dec. 8, p. 821) has pointed out, there is no guarantee that the refill needle will penetrate to exactly the same depth in exactly the same place as the needle for the analgesic; thus the latter cannot usefully assist in the prevention of air embolism. Furthermore, the use of novocain introduces a new source of risk, since definite, though rare, cases of novocain poisoning have been recorded; a recent fatal example is described by Andosca and Foley (*Amer. Rev. Tuberc.*, Sept., 1945, p. 221).

Concerning the problem of pleural shock, we are of the opinion that no such clinical entity exists. This vexed question has been debated *ad nauseam* in the literature of artificial pneumothorax. For the latest discussion on the subject the reader is referred to the paper by Andosca and Foley, quoted above. Even if there were such a condition it is hard to see how its occurrence could be prevented by the use of a local analgesic, for the needle, itself as liable as the refill needle to produce shock, must penetrate the parietal pleura before that membrane can become fully anaesthetized.—We are, etc.,

Red Cross Sanatorium of Scotland, Tor-na-Dee. B. G. RIGDEN. PHILIP STEEN.

SIR,—During six months, from February to July, 1945, as house-physician at the Brompton Hospital, I did more than four thousand artificial pneumothorax refills. The great majority of the patients at Brompton—certainly more than 90%—prefer not to have a local analgesic; and this is true also at the Chest Clinic at Hammersmith Hospital, where I now work.

Most of your correspondents agree on this point, and they say that providing the needle is sharp and a rapid plunge is made there are few complaints. If there is an adequate pleural space then this technique is safe; but if the artificial pneumothorax is shallow then I believe a local analgesic should be used so that the needle may be slowly and carefully introduced. Otherwise there is a danger of puncturing the lung, and this may be followed by air embolism—an event which one should strive to avoid, however rare it may be. The other indication for giving a local analgesic is—as Dr. H. P. Fernandes points out (Dec. 8, p. 822)—when the patient asks for it. If it makes him feel any happier, then I think he should have it.—I am, etc.,

Chest Clinic, British Postgraduate Medical School, London, W.12. RAYMOND WILLIAMS.

SIR,—Dr. C. F. Hawkins is not alone in his belief that local analgesia is unnecessary before giving an artificial pneumothorax refill. I have known several leading physicians who practise an almost identical technique to that described, using the Morland needle. I, myself, and most of my contemporary colleagues used this technique for hundreds of refills at a famous chest hospital. It was usually found that novocain was not required after the fourth or fifth refill. The procedure was always explained to the patient beforehand. It is important to use the same place for refills so far as possible, as this area undoubtedly becomes less sensitive. If, for any reason, it is necessary to change the point of entry I always use novocain on the first occasion.

"Refill patients" become more attached to one particular doctor than any other class of patient I have come across. It is important that this relationship should be fostered in the early stages of the induction of an artificial pneumothorax; the change-over from the use of novocain to doing it without it is then readily accepted. Every patient I have questioned in an out-patient refill clinic was horrified at the suggestion of using novocain for the refills. With novocain there is not only the slight discomfort of the injection but also a more irritating itching two hours later as the numbness wears off.

I agree with Dr. Hawkins that complications are no more frequent in an established A.P. when local analgesia is disregarded.—I am, etc.,

Bletchley, Bucks. P. MCA. ELDER, Fl. Lieut.

SIR,—I thoroughly agree with the opinion of Dr. C. F. Hawkins in his letter (Nov. 24, p. 742) in every detail. One occasionally meets a patient who is hypersensitive or of a nervous temperament, but even in such cases I find that the use of a local analgesic for a refill after an adequate pleural space is obtained only adds to the patient's discomfort. I use a Morland needle and have been fortunate enough not to have experienced a case of pleural shock so far. Such cases appear to be rare. Like Dr. Hawkins, I shall indeed be grateful to have the views of others.—I am, etc.,

West Ham Sanatorium, Dagenham. G. M. MAYBERRY.

Treatment of Early Syphilis: A Warning

SIR,—As far back as Nov. 11, 1939 (p. 974), I suggested in your columns a reliable scheme for the treatment of early acute syphilis. A similar scheme, with or without penicillin, has been used to date for many Service and civilian cases. Penicillin has now taken an important part in the treatment of venereal diseases. It rightly holds the first position as a therapeutic agent for the treatment of gonorrhoea. Gonococcal relapses or failures do occur, but, generally speaking, the results are very good.

I wish, however, to register a strong word of warning against any present tendency to depend on penicillin alone for the treatment of acute early syphilis. The tendency to shorten treatment can be carried too far. We do not want to see cardiovascular and neuro syphilitics turning up at the V.D. clinics some years hence. I can produce definite evidence of failures or relapses in early syphilitics treated by penicillin alone. No doubt other senior venereologists could do likewise. Penicillin alone may cure some cases, but so did a few injections of "606" 27 years ago. Ask any British venereologist what treatment he would prefer himself if he had a chancre or a secondary syphilitic rash. The answer, I think, in most cases would be penicillin *plus* at least one course of ten twice-weekly injections of neoarsphenamine and bismuth. He would also desire blood tests (Wassermann and Kahn tests) and a C.S.F. examination up to three years from the date of infection.

We have now a wonderful opportunity to reduce the incidence of venereal disease in this country. Let us do it thoroughly. Educate the public on the dangers of venereal diseases and, above all, give adequate treatment and tests of cure.—I am, etc.,

Leicester. C. HAMILTON WILKIE, Director of V.D. Services.

Tobacco Smoking and Health

SIR,—In connexion with the recent correspondence on tobacco smoking may I remind your readers of some facts. Stomatitis and pharyngitis (with their associated spitting and hawking) are characteristic of heavy smokers. Cancer, buccal and bronchial, is much more common in men than in women and in smokers than in non-smokers. Bronchus carcinoma becomes more common as the consumption of tobacco increases. I have under my care at present a lady with extensive buccal leukoplakia and a large epithelioma inside the cheek. She has smoked heavily, has been edentulous for years, has not drunk spirits, nor had syphilis.

Tobacco distillate is a tar rich in aromatic substances with polycyclic benzene nuclei, belonging to the same class as those extracted from coal-tar and proved to be carcinogenic. Tobacco tar has high carcinogenic properties (up to 100%) in experimental animals. It is easy to produce epithelioma

on the ears of rabbits by painting them with tobacco distillate (Prof. Roffo, "Krebserzeugende Einheit der verschiedenen Tabakteere," *Dtsch. med. Wschr.*, June 16, 1939, **65**, No. 24). The chronic inflammation which can so easily be seen in the mouth and throat of heavy smokers no doubt extends into the trachea and the bronchi, as shown by the experience of anaesthetists who find that heavy smokers are difficult to anaesthetize because of the irritability of and mucus in the respiratory passages, and that pulmonary complications after anaesthesia, from slight cough to pneumonia and atelectasis, are chiefly found in heavy smokers (see Lundy's book on anaesthesia).

Now for prophylaxis. When our children are growing up we should warn them: (1) That tobacco does harm. (2) That they cannot take at face value the statements of smokers about smoking, because many smokers, physicians or laymen, are drug addicts and have lost the power of giving an objective, unbiased opinion about their own habit. The smoker wishes to continue the use of tobacco without appearing a fool or a drug addict. His self-esteem therefore demands that he close his mind to any suggestions that tobacco may be harmful or that it is a drug. (3) That advertisements are designed by clever men to trap young people into taking a drug, that many so trapped will never be able to give up the habit, and that the object of the advertisement is the financial gain of the advertiser regardless of the welfare of the victim. The mechanism of the trap is to show from all points of vantage, day after day, year in and year out, the use of tobacco by types of people who are admired, emulated, and envied by children and adolescents. For the boys the hook is baited by the fine manly picture of an explorer, or soldier in some far-flung outpost of Empire, or of a sailor or sportsman. For the girl the hook is baited by the picture of a beautiful woman, superbly dressed and smoking her cigarette with the utmost poise. To be "smart" is an inducement held out to both boys and girls. The obvious cumulative effect is insidiously and subconsciously to fix in an immature mind the suggestion that if the victim would only adopt the actions and habits of the magnificent being in the advertisement then he would come more nearly to resemble that creature.

If we forewarn and educate our children in this way we will have done our best to preserve them from at least one disease, with its many complications.—I am, etc.,

Sydney. V. J. KINSELLA.

Nylon for Buried Sutures

SIR,—Shortly after reading Mr. Herbert Haxton's article (Jan. 6, 1945, p. 12) on nylon for buried sutures I began using it for all parietal sutures. I can therefore look back on its use for some eleven months, and can make some observations that may be of interest.

My method of tying knots is to hold the long end taut while tying both halves of a reef-knot with the short end in the left hand. Haxton's method of changing hands for the locking half-knot thus did not come easily to me, nor have I used it. I have made up for this by tying four or five half-knots in my habitual manner using both halves of the reef-knot alternately. The resulting knot, unwieldy in catgut as it would be, is quite unobtrusive in fine nylon, and does not slip.

It struck me that there could not be any objection to the use of nylon for the uterus in Caesarean section, but that the more bulky knot occasioned by the use of heavier-grade suture might give rise to peritoneal irritation. This has not been borne out clinically. In common with all abdominal cases, Caesareans are more comfortable *ab initio* than those in which catgut has been used. Hernias are notably more comfortable, and the rehabilitation of all goes on practically without prompting, and with very little need for instruction. In such a short time I have not had occasion to reopen any of my cases, but I have no doubt that Haxton's observation on the lack of tissue reaction is, in fact, the case.

While accepting all that catgut manufacturers say about improvements in their art, I cannot rid my mind of the uncertainty in the lasting qualities of catgut in the presence of tissue digestion, and the feeling of security in the use of nylon is very comforting. I doubt if I shall ever change from it.—I am, etc.,

Dorchester. T. RUSSELL STEVENS.

Pasteurization of Milk

SIR,—I am afraid Dr. Ronald Clarke (Nov. 10, p. 666) has missed the main point of my letter, which should be regarded as a whole. The point I was deploring was the tendency of many doctors to regard good health from a very materialistic and mechanistic point of view. They seem to have divorced it entirely from that mysterious force we call Life, and think of it only in terms of the presence or absence of disease germs, so that all that is necessary for perfect health is to inject some laboratory substance under the skin, or pasteurize our food (however dirty or non-nutritious), and immediately good health is had by all. It is this wrong emphasis which I consider is a serious factor in much of the preventable ill-health of to-day. The general public is led to believe that there are no such things as natural laws of health, and that they can live as unhygienically as they wish and remain in good health if they carry out the short-cuts of inoculation and pasteurization.

It is quite obvious if we look around us that a high degree of immunity against all infections—including tuberculosis—can be obtained by regularly carrying out certain simple matters of hygiene in regard to exercise, fresh air, dietetics, etc., and in adopting a right mental attitude to the adventure of life. These are the things which bring about what has been called "positive health," and should always be stressed when we are trying to cure or prevent disease, whatever our method of treatment.

If now in the question of our milk supply we regard pasteurization as the *final* word in its preparation, we encourage laziness and dirty habits in our dairy workers and overlook the importance of good health in our cattle. Dr. Clarke says "pasteurized sewage is at least sterile, and is probably preferable to tuberculin-tested milk with typhoid bacilli," thus overlooking the fact that sterilized sewage has no food value, and will contain many poisonous substances not conducive to health, even though it may be free from disease germs. Milk, on the other hand, which has come from robust cows and has been handled with scrupulous cleanliness at all stages will not contain typhoid bacilli and will not need pasteurizing; moreover, it will have a very high nutritional value.—I am, etc.,

Slough, Bucks. H. TUDOR EDMUNDS.

National Research into Tuberculosis

SIR,—Dr. George Luntz's letter (Dec. 1, p. 781) raised an issue which no worker in the field of tuberculosis can ignore. It is time indeed that we made a proper appraisal of our present methods of treatment as they can be applied to the sufferer from the most prevalent manifestation—pulmonary tuberculosis. This disease is so treacherous that one never feels secure when giving a prognosis; perhaps one only remembers the unfortunate cases; but they occur much too frequently. The majority of cases that enter sanatoria are not suitable for any form of collapse therapy, and of those cases that are how many benefit from it? Now that these methods of treatment are coming under critical review it is being increasingly realized that they are over-used and, to a great extent, overrated.

If the gloomy side of the picture has been over-emphasized here, it has been done to point the moral—the answer to the problem of tuberculosis has not yet been discovered. Now that we have entered the era of specific treatment with chemotherapeutic substances our hope is that such a substance exists which can be used to cure tuberculosis. No effort or expense should be spared in the attempt at its discovery and we should tolerate no delay. It is a prime responsibility of the medical profession and the Government, in meeting this national problem, to set up a special research unit with this object in view. As Dr. Luntz remarks, the reward will be the gratitude of all mankind.—I am, etc.,

London, N.W.3. S. M. HILTON.

Physical Therapy in Mental Disorder

SIR,—It is now two years ago that you published two letters from me, and many letters from others, on the subject of the new physical methods of treatment of mental disorder, especially electrically induced fits. In these two years a very large number of people have been treated by induced fits: to some harm has been done and some have been "cured." The fact remains, in my opinion, that these forms of therapy have disadvantages, the most serious of which is that false

theories of mental disorder are built up round wrong interpretations of the mechanism of these "cures." The medical profession should be reminded from time to time that these treatments are pure "shot-in-the-dark" affairs, and no theory of their action, even when they seem to work, is accepted even by the psychiatrists.

The great example of this bad result of building on other than scientific foundations is provided by the treatment of mind disorder by operation on the brain. In good faith members of our profession are cutting brains about, dividing the associating fibres between the frontal lobes, devising other ways of using their brilliant team work and surgical technique. Yet enough is already known of mental disorder for it to be said that no mentally ill person can ever be made well by operation on a normal brain. In fact, it must be an important part of every leucotomy treatment to see that if the patient gets well enough to go out and do his shopping and go to the cinema he does not also regain the right to vote, or take an active part in the arrangement of our affairs. He is permanently maimed.

I realize that the correct procedure is for us to speed up research into the psychology of insanity and so to provide a scientific basis for mental hospital work, but in the meantime are we to see our countryside littered with "cured" mental hospital patients with permanently deformed brains? And what happens if these physical therapy methods spread to the treatment of criminals? What guarantee have we that a Bunyan in prison will be allowed to keep his brain intact and his imagination free, or, to take a more ordinary case, that a political prisoner should be allowed to maintain his political convictions and his brain.

A new habeas corpus is needed now, a "habeas cerebrum," and very quickly. At any rate I should be grateful if your journal could once again make it possible for it to be said that there is one doctor who thinks the new physical therapy of mental disorder is sociologically dangerous, and that surgical interference with the brain in mental disorders is absolutely never justified.—I am, etc.,

London W.1. D. W. WINNICOTT.

Future of Venereology

SIR,—This is the age of planning, and we as a profession have been duly warned that our future activities will soon be subject to a control which we can only hope will be wise and paternal. The intervening period while our masters are making their plans is a period of difficulty for many young men who are returning from the Services either without a settled appointment or with an appointment which is not in keeping with their added years and experience. In many special subjects these young men are able to bridge the gap and support themselves by temporary registrarships or by research scholarships.

For my own subject—venereology—there is no such provision. Although figures are not yet available, it would probably be conceded generally that, taking all theatres of war, the venereal diseases were the major health problem of the armed Forces of the Crown. It is certain that in some places the problem assumed such proportions that the situation was saved only by heroic energy and improvisation. Many young men of high quality have had much experience in this subject and are continuing to take a deep interest. Some of them have already returned to civil life, and they are inquiring about the possibility of continuing their specialized work. In almost every case the answer has to be discouraging. There are no prospects; nothing is known of plans.

How is one to advise these men? Who are the planners and what is the substance of their plans for the future of venereology? Is it possible that there are no plans, or do the planners share the prevailing illusion that penicillin has provided the answer to all our problems in this respect? It is important that we should know. These young men must live, and if their ability and experience are to be used action must be taken now and not in three or six months' time. By that time the best of them will have made other arrangements. The alternative is to allow this vitally important subject to remain, what it has so often been, the perquisite of the elderly, the unprogressive, and the unimaginative, who practise their obscure routine in some forgotten basement.—I am, etc.,

A. J. KING.

Scalenus Anticus Syndrome

SIR,—As an observer only, I have been impressed by the number of patients suffering from this distressing and disabling condition who have been treated in the Orthopaedic Department of the Luton and Dunstable Hospital and have been cured by a simple operation. The condition does not appear to be well known; many of the patients have been in misery for a considerable time and have attended hospitals, and even neurological units, without benefit.

Briefly, the symptoms resemble those of a cervical rib, starting with brachial pain, accompanied by tingling and numbness in the hand, and associated with pain behind the shoulder. A typical case is as follows: (1) There are the symptoms of a progressive "idiopathic" brachial neuritis. (2) The patient is young to middle-aged. (3) In right-handed people only the right arm is affected. (4) The sufferer has been doing some extra or unaccustomed manual work. (5) There is no neuritis, fibrositis, or arthritis elsewhere. (6) The condition is not affected by administration of vitamin B_1, and is made worse by the usual massage and electrical treatment. (7) Frequently the patient has been diagnosed as neurotic, hysterical, malingering, etc. Radiological examination shows no bony abnormality such as cervical rib, osteo-arthritis of cervical spine, etc. So far as possible foci such as diseased teeth, tonsils, or sinuses have been excluded.

I am informed that the injection of a local anaesthetic into the scalenus anticus muscle quickly relieves the pain and confirms the diagnosis. The operation is simple and consists in cutting the scalenus anticus muscle and cleaning the fibrous connective tissue from the cords of the brachial plexus. I believe that in about 95% of cases relief is obtained very rapidly, and that this is complete, except that some patients still complain of the pain behind the shoulder.—I am, etc.,

Luton, Beds. HUBERT O'MEARA.

Staffing of County Hospitals

SIR,—The Council of the Association of Anaesthetists of Great Britain and Ireland is disturbed to find the following statement made by Dr. H. M. Macaulay in his article on "The Staffing of County Hospitals" published in the *Lancet* for Dec. 1 (p. 717):

> "The department of anaesthetics will be staffed, on the same principle, by an experienced senior anaesthetist holding a diploma, a less experienced chief assistant also holding a diploma, as well as resident and house anaesthetists. On the grounds that anaesthetics is a limited speciality, the salary scale is put somewhat lower than that for a general physician or surgeon, and it is recommended that senior anaesthetists should receive £1,000, rising to £1,400, or in cases of exceptional achievement to £1,600. Chief assistants will receive £650, rising to £850, resident anaesthetists £400, and house anaesthetists £250 yearly."

This practice of differentiation between the various specialties is now rather out of date. No such differentiation has been made in the Navy, Army, Air Force, or E.M.S. during the war, and it is presumed that there will be none in the proposed National Health Service. In chap. 4, para. 62, p. 92, the Goodenough Report on Medical Schools deprecates any difference in the rates of pay of various specialists and consultants in regard to their employment as teachers. If this recommendation holds good in the case of teaching, it must surely do so for clinical work, for the same difficulty in getting good men to enter for a poorly paid post will arise. It is common knowledge that the Standing Committee of the three Royal Colleges has established certain criteria for the recognition of consultants. Consultant anaesthetists are proposing to adopt these criteria and will expect in future the same reward as a specialist in any other branch of medicine.

The Council is at a loss to understand what Dr. Macaulay means by a "limited speciality" and would refer him to the annual reports of the Section of Anaesthesiology of the Mayo Clinic in the United States, which show that the limits of the specialty commonly known as "Anaesthetics" in this country are always extending.—We are, etc.,

A. D. MARSTON, President.
W. ALEXANDER LOW, Hon. Secretary.

Association of Anaesthetists, 45, Lincoln's Inn Fields, W.C.2.

Buying and Selling Practices

SIR,—This whole question should be reconsidered and discussed from every point of view. There are basic reasons for deprecating the sale of practices altogether. A practitioner presumably charges and obtains a just price for his services to his patients. On giving up practice it is his duty to provide continuity of treatment for his actual and potential patients. Does this justify him in demanding a large capital sum from the successor he has selected, over and above the just price he has received for past services? To many minds this is an unhandsome proceeding which cannot but lead to grave abuse.

Canvassing is forbidden us as members of an honourable profession, though canvassing is universal in the capitalist society in which we practise. To sell to the highest bidder is normal commercial ethics. Is it good enough for our profession? If a practice can be sold the temptation to sell to the highest bidder is inevitable, irrespective of the good of one's patients, which is supposed to determine medical ethics, and inevitable also is the boosting of the proposed buyer, than which there can be no more effective form of canvassing. The effect of selling practices is to make boom periods still more "booming" and to cause "slumps" to "slump" still further. A prospective seller is always tempted to wait for the former and artificially inflate his practice as much as possible while the going is good. The sale of practices encourages the technique and methods of the practitioner who believes and preaches that the best doctor is he who charges the highest fees and makes the most visits. Many a beginner or newcomer finds too late that he has bought the bad-will of patients increasingly resentful, who are only waiting for the seller to go to "make a change," and that he faces a time of slump with a boom debt.

If, however, the whole status of the medical practitioner as hitherto understood in Christendom is to be altered other considerations come in. Hitherto the patient and doctor have both been principals in the business of diagnosis and treatment, and no third person has the right to intervene. But if the doctor is to be a conditioned agent of the politicians and the civil servants, vetting according to the plans of these gentry a conditioned worker, this is so alien a notion to Western civilization and to what the profession has hitherto understood that practitioners may justly press for reasonable compensation from the politicians for loss of income.—I am, etc.,

London, N.16. E. H. STRANGE.

SIR,—According to the latest Ministerial pronouncement the buying and selling of medical practices is to be abolished by legislation. A schedule of the capital values invested in, or represented by, the different practices will be a necessary preliminary to any measure of compensation to individual practitioners. In any such valuation it is to be hoped that consideration will be given to the position of those doctors—notably in London and the East Coast towns—whose practices largely disappeared as a result of war risks and incidental conditions. Their patients migrated, either voluntarily or under official pressure, and went to swell the practices of colleagues in other parts of the country. The doctors found other employment, mostly in one of the Services, and have so far had little or no chance to resuscitate their pre-war practices and re-establish their "capital value." In these cases, at least, it would seem equitable to make a valuation based on the 1939 earnings, as shown by certified accounts or income-tax returns.—I am, etc.,

"THANET."

The Bristol Council for Rehabilitation has appointed the following officers: Chairman, Mr. A. G. Thompson; Vice-Chairman, Mr. F. R. Imison; Joint Hon. Secretaries, Mr. P. Hanks (secretary, Winford Orthopaedic Hospital) and Mr. John Dodd (hon. secretary, Bristol and District Divisional Hospitals Council). Reference was made at a meeting of the committee to the reluctance of disabled people in Bristol and district to register under the Disabled Persons (Employment) Act. The Council hopes that disabled persons (including those who may think their long-standing disabilities preclude any possibiiity of their getting employment) will realize that it is to their advantage to register under the Act.

Obituary

LEWIS CAMPBELL BRUCE, *M.C.*, M.D., F.R.C.P.Ed.

The death of Lewis Campbell Bruce on Dec. 3 in his 79th year severs almost the last link with the supreme period of Scottish psychiatry in the closing years of the last century and the early ones of this. There were giants in the land in those days, and it is strange to reflect that Bruce was regarded by many of them not only with respect as an original thinker and worker, but also, and even chiefly, as a dangerous innovator and something of a revolutionary.

He qualified at Edinburgh in 1894 and had an Army career as his goal, but had the great misfortune, in those days of few vacancies and severe tests, to fail to gain entrance either to the R.A.M.C. or to the I.M.S. He turned his attention to psychiatry, and joined the staff of Morningside under Sir Thomas Clouston. There he developed that combination of clear scientific thinking with intense energy and enthusiasm which characterized his whole life. In 1899 he was appointed medical superintendent of the 400-bed Perth District Mental Hospital at Murthly in succession to Prof. G. M. Robertson, who had been appointed to Larbert. Six or seven years later he suffered the crowning disappointment of his career when, to the general surprise, Robertson, and not he, was appointed to succeed Clouston at Morningside. As it happened this apparent setback was the proverbial blessing in disguise, for Bruce, with all his brilliancy, would have been miserable in the post. He was rather embittered for a time, and one or two further opportunities of promotion were practically thrown away by him, apparently by his offhand manner, but perhaps because he was already realizing that he was the ideal man for Murthly and Murthly was the ideal place for him. Into that small country hospital beside the River Tay he threw all his abilities and energies, and for 35 years made it a model of efficient and enlightened administration, a place of humane and skilful psychiatric treatment, and a source from which proceeded first-rate scientific work. He established and equipped a small laboratory which was his constant joy and pride. He trained members of his staff to do the work of laboratory technicians, prepare media, look after the animals for experiment, and so forth, and was one of the first medical superintendents, if not indeed the very first, to put out his own original work from the hospital of which he was in charge.

It was Bruce who introduced the thyroid treatment of the insane. He was an enthusiast on vaccine therapy, and one of his chief lines of research was on blood changes in the manic-depressive psychosis—the subject he chose for his Maudsley Lecture in London in 1935. His scientific work never received all the recognition it deserved, partly because of the advances in knowledge and change in outlook during the last twenty years, and partly no doubt because he worked in isolation, and not in association and collaboration with others. But the memorable thing about his work is not its value and results so much as the amazing pertinacity and skill with which it was carried out in a tiny laboratory, often with improvised or home-made instruments and apparatus, without the stimulus of colleagues, and in the teeth of obstruction and misunderstanding from an uninformed hospital committee.

Bruce was a devotee of scientific method and clear thinking, and his other ruling passion was the open air and every form of outdoor life and activity. He had one assistant medical officer, and, as a rule, liked a change every eighteen months or so. Fortunate indeed were the men who had a period at Murthly as their introduction to psychiatry. The first practical result with most of them was the completion of an M.D. thesis, more often than not up to gold medal standard. Bruce was forthright and outspoken to a very great degree. He was often the reverse of tactful, was matter-of-fact and unsentimental; he not merely could not suffer fools gladly, he could not suffer them at all. Doubtless, especially in his earlier days, he antagonized those who did not know him, and very few people whom he disliked remained in ignorance of the fact; but a short acquaintance made it clear that his impulsive ways and his sometimes caustic words were expressions of a loathing of cant or affectation and a flaming scorn of anything mean or insincere. He had no use for "sobstuff" and a bitter contempt for the shirker, but his kindness to anyone who was sick or in trouble and his understanding and toleration of human frailties and lapses were unbounded. His administration was strict, and his discipline may have seemed stern and even harsh at times to outsiders, but few, if any, medical superintendents can have been held in such affection by their medical and nursing staff as he. No one who worked for him could fail to realize that he was a man with whom fair play was a passion, and to whom one could safely confide one's inmost secrets and deepest troubles.

Bruce's mental and physical energy were alike amazing. The day's routine at Murthly, with its altogether delightful mixture of

work and play, both at full pressure and express speed, may perhaps seem a little old-fashioned to modern neuropsychiatrists, but it was a uniquely pleasant and beneficial experience to the succession of assistants who enjoyed it year after year, until, as he characteristically remarked, the time came when they became more trouble to train than they were worth, and he carried on the work of the hospital single-handed. After the outbreak of war in 1914 he gave his committee no peace until he obtained their permission to join the Forces. He went to Gallipoli at the age of almost 50, acquitted himself gallantly, and was awarded the Military Cross. On his return he ran Murthly as a war hospital for a year or two, and then settled down again, with characteristic lack of fuss, to civilian life.

Bruce was a born teacher, concentrating on the physical aspect of mental disease. He had no use for psychopathology, nor did it interest him. As a clinician, however, he was in the first rank. He had many friends in the medical faculty of Edinburgh University, and made a point of keeping in touch through them with every development in clinical medicine and biochemistry. Above all he insisted upon the great principle that it is impossible to understand the psychoses, or even to talk sense about the psychoses, unless one has lived among psychotic patients. Slovenly work or muddled thinking he abhorred, and few people would willingly risk his displeasure twice. On the other hand, few indeed of those who ever worked for Bruce left his service without feelings of gratitude and affection, and none without feelings of respect. To have made himself generally recognized during so many years in that small country hospital as one of the keenest scientific minds, and certainly the most vivid personality, in Scottish psychiatry was a supreme achievement. He retired in 1936 and carried on his country pursuits near Lockerbie in Dumfriesshire, where the local people, once they appreciated that here was a man whose knowledge of country life was unsurpassed, made him very welcome. The old impulsiveness and irascibility had become mellowed, but the clear-thinking brain was alert to the very end, and his interest in every psychiatric development was as keen as ever.

H. Y.

G. ARBOUR STEPHENS, M.D.

Dr. George Arbour Stephens of Swansea, who died suddenly on Dec. 1, was of Huguenot descent through his father, was born on the other side of the Loughor, at Carmarthen, in 1870, and went to school there, afterwards going on to University College, Aberystwyth. In 1888 he took the B.Sc. of London University, with honours in zoology, and entered for his medical training at University College Hospital, London, qualifying M.B., B.S. in 1892, with first-class honours in materia medica and honours in medicine. In the following year he took his M.D. Settling in Swansea, he remained there for the whole of his professional life. In later years he specialized as a cardiologist and also in industrial medicine. He was consulting cardiologist to the Welsh National Memorial Association and to Carmarthen County Council and consulting physician to the Cardigan and District Memorial Hospital and to Llandovery and Clydach cottage hospitals. He took an outstanding part in the initiation of infant welfare work in Swansea, was co-founder of the first Mothers and Babies Welfare in Wales, and a pioneer of mothercraft classes for schoolgirls and of the institution of school meals. His position as a surgeon under the Factory Act gave him long experience of some Swansea industries, and he carried out some research in this field. He was a past-president of the Swansea Medical Society.

Arbour Stephens took a considerable part in the public life of his town and of the Principality. For 13 years he was a member of the board of guardians and for some time chairman of the Glamorgan joint poor-law committee for the feebleminded. For 18 years he was a member of the town council, latterly an alderman, and for 9 years chairman of the education committee. He represented the Swansea municipality on the governing body of the University College; the college had been intended only for science courses, but on his advocacy it was widened to include the full arts faculty. Recently he had advocated a veterinary college for Wales. His principal medical writings were on the prevention and relief of heart diseases and on the heart and spleen in health and disease. He also wrote on archaeology and folklore. He first joined the British Medical Association in 1901. He married in 1922 Mary Williams, D.Litt., professor of modern languages, Swansea University College.

F. H. K. K. writes:

The sudden death of George Arbour Stephens deprives the profession of a dignified, cultured figure whose wide interests covered a very large field not only in his own profession but also in the field of local government and particularly in education. Settling in general practice in Swansea he soon built up a reputation for originality of outlook, and he had no hesitation in discarding any orthodox views if they did not come up to his own high standards of scientific truth. Later he specialized in cardiology and industrial medicine, and the almost total disappearance of cases of lead poisoning among the spelter workers whom he regularly examined and on whose welfare he wisely advised is perhaps the greatest monument to his life's work. He served on the Swansea Board of Guardians for many years and for 18 years served on the Swansea town council, many of which years were spent as chairman of the education committee. He was on the governing body of the University College of Swansea and of the National Library of Wales and also the Welsh National Museum. His ideas were prolific and many of them in advance of his time, and the non-acceptance of some of them left him scornful of his fellows. Nevertheless those who knew him best and those who had received at his hands help, advice, and comfort when in distress will remember him as a dignified, wise, and generous-hearted colleague and a fine useful citizen.

H. M. MORAN, Ch.M., F.R.C.S.Ed., F.R.A.C.S.

Herbert Michael Moran, born of Irish parentage on April 26, 1885, died at Cambridge on Nov. 20. He graduated at Sydney in 1907, and after resident appointments toured Great Britain in 1908 as captain and "guardian angel" of the first visiting Australian rugby football team. When the team returned to Australia "Paddy" Moran remained behind in England and continued his postgraduate studies, taking his F.R.C.S.Ed. He became extremely interested in radium and the development of radium therapy both in England and on the Continent, as well as in America. In order that he might utilize the knowledge and experience he had gained in this field he took back to Sydney with him several thousand pounds' worth of the (then) new radium needles. Until his retirement in 1935 he held the appointment of cancer specialist at Prince Henry's Hospital, consultant at the Royal Prince Alfred and the North Shore Hospitals, surgeon at the St. Vincent's and Lewisham Hospital, and lecturer in radiotherapy at Sydney University. During 1934 he gave a series of lectures in the treatment of cancer by radium to the medical profession in New Zealand, at the instance of the New Zealand branch of the British Empire Cancer Campaign. In 1935, although a surgeon, he was president of the Section of Radiology and Radiotherapeutics of the B.M.A. Annual Meeting held at Melbourne.

During the first world war he served in the R.A.M.C., and rejoined it in 1939, retiring as lieut.-colonel in 1945. His deep interest in human nature, together with his shrewd sound judgment, amply fitted him for the position of president of the Eastern Command standing medical boards, which he held for the last years of his life. His interests were not only in medicine and sport but also in foreign languages and literature, and his achievements in these fields were notable. Having initiated the teaching of Italian language and literature he became in 1934 acting president of the Foreign Language Association, Sydney; a member of the French society, "Amitiés"; and a life member of the Dante Alighieri Society. The Paul Bosel medal for Italian language and literature was awarded him, and his work in encouraging the study of languages was recognized by the conferment of Knight Commander of the Order of the Crown of Italy and Chevalier in the Order of St. Maurice and St. Lazarus. In 1934 he founded the Sydney branch of the Guild of St. Luke and St. Damian, Sydney. His autobiography, *Viewless Winds*, was published in 1939; *Beyond the Hills Lies China*, a narrative, in 1945. The continuation of his autobiography, *In My Fashion*, will be published in 1946. He was a life member of the New South Wales Rugby Union as well as Australian representative on the English Rugby Council. This interest in sport characterized his whole life. His dash and verve and leadership, coupled with his scholastic ability, endeared him to many. He died as he had lived, a sportsman to the end.

C. F. E.

MARGARET BALFOUR, C.B.E., M.D.

Miss C. L. Houlton, M.D., F.R.C.O.G., Secretary, Medical Missions, S.P.G., writes:

The news of the death of Dr. Margaret Balfour will be received with great regret by all medical women in this country and in India. Dr. Balfour had a most distinguished and varied career in India. She will long be remembered for the great service she gave to Indian women in the provision of medical relief, especially to those prevented by purdah restrictions from being attended by medical men.

Dr. Balfour first went to India in 1892, and until her retirement in 1924 devoted herself unsparingly in the advancement of medical services for the women and children of India. She was intensely

interested in all problems relating to maternal and child welfare, and especially in research connected with anaemias of pregnancy and osteomalacia. Her stimulating personality enabled her to arouse enthusiasm in all those with whom she worked. Nothing daunted her, nothing discouraged her, and she never lost her keenness. Dr. Balfour's outstanding achievements were connected with the Countess of Dufferin's Fund. This Fund was formed in 1885 by Lady Dufferin to bring medical aid by women to the women of India, and undoubtedly carried out a great piece of humanitarian work; but after Lady Dufferin's departure from India the activities of the association gradually decreased and its reputation fell. The position of medical women serving in the association was most unsatisfactory and caused great discontent in the profession. Representations by medical women were made to the Government of India and to the Secretary of State for India which finally resulted in the foundation of the Women's Indian Medical Service in 1914. After a delay of two years Dr. Balfour was appointed joint secretary of the Countess of Dufferin's Fund and chief medical officer of the Women's Medical Service. The duties of the secretary included administration of the Women's Medical Service—that is, the inspection of the personnel, the selection of applicants in India, the arrangements of appointments, transfers, etc. They included also the secretaryship of the Funds of which the Viceroy's wife was president—the Countess of Dufferin's Fund, of which the income was spent in grants to hospitals, and the Victoria Memorial Scholarship Fund, used for assisting in the training of indigenous dias; and later the Lady Chelmsford All-India League for Maternity and Child Welfare was added to the other duties. New lines of activity suited to Indian conditions were to be thought out and organized in the Dufferin office, and Dr. Balfour's initiative and energy were responsible for working out schemes on preventive medicine, especially relating to the problem of childbirth and child welfare. She was largely responsible for the initiation of the "Health School" in Delhi for the training of health visitors and maternity supervisors, and also for the first Maternity and Child Welfare Exhibition held in Delhi in 1920. The organizing work of the exhibition was done in the Dufferin office, and involved an immense amount of labour on the part of Dr. Balfour. Looking back it is clear the exhibition was a remarkable effort and one which had an immense effect in stimulating people to take up child welfare work in India.

Dr. GEORGE A. MAXWELL HENDRY, who has died at the early age of 33, studied medicine at Aberdeen University. As a student he suffered a prolonged interruption of his work due to a serious illness. He faced this setback bravely, however, and graduated M.B., Ch.B. in 1941, having reason to hope that his recovery might be permanent. After qualifying he entered general practice as an assistant in Aberdeen and latterly in Beauly. He became a member of the B.M.A. Early this year, wishing to qualify for a higher degree, he took up work at the Southern General Hospital, Edinburgh. Those who knew Hendry most intimately, writes a colleague, speak of him as a tireless worker. Clinical findings had to be checked over and over again before Hendry was satisfied, and he would spend hours on a difficult or puzzling case. Essentially a worrier, he was ever solicitous of his patients' well-being, while many a time his Scottish humour helped to make the rough places smooth. Perhaps it was because he had faced trouble in his own life that he was enabled to be extraordinarily gentle and kind in the presence of sickness or bereavement. In hospital Hendry was never far away from the bedside, or the microscope, or the laboratory, and this capacity for hard work and thoroughness spread infectiously to the medical students under his wing. His case notes remain as an example of all that case notes should be—concise, exhaustive, accurate. It was a shock to his friends when a recrudescence of his former illness occurred. He had to face the dreary prospect of prolonged invalidism; and for a time it seemed that he might do well. The suddenness of his final passing on Nov. 29 was as unexpected as it was tragic. Dr. Hendry was the only surviving son of Dr. and Mrs. G. F. J. Hendry of Voe, Shetland. Prof. L. J. Davis sends the following appreciation: Although G. A. M. Hendry had been qualified longer than most hospital residents on first appointment, and had been away from hospital work for some years, he was one of the most satisfactory house-physicians it has been my good fortune to encounter. His enthusiasm for his work was unbounded and his conscientiousness outstanding. Although he had acquired a sound knowledge of medicine, his approach to clinical problems was always attended by a thoughtful humility and a desire to learn all that careful observation and untiring inquiry could teach. He had, furthermore, a very pleasant personality, being popular alike with patients, students, and staff. His tragic death at the early age of 33 removes a very promising member of the profession, and one of a type that can ill be spared.

The death of Dr. ROBERT GORDON at the age of 82 occurred on Nov. 13 at his residence at Beaconsfield, Bucks, where he had lived in retirement for twenty years. Graduating M.B., C.M. at Edinburgh in 1885, he proceeded to the M.D. degree in 1899, and thereafter practised in Sheffield until his retirement in 1925. He was representative of the Sheffield Division of the B.M.A. from 1909 to 1913, a member of the Division executive committee from 1904 to 1914, and vice-president of the Section of Diseases of Children on the occasion of the Association's Annual Meeting at Sheffield in 1908. During the war of 1914–18 he was appointed visiting physician to the Wharncliffe War Hospital, and afterwards became one of the examining medical officers to the Ministry of Pensions as a neurologist. Dr. Gordon enjoyed the affectionate regard of many friends; and at Beaconsfield after his retirement he soon became an active member of the community. He was a member of the local urban district council for some years, and his sound judgment and kindly interest in the welfare of others continued until his death. He will be greatly missed by all who were privileged to know him.

JAMES CHARLES BUCKLEY, M.D., died at Southfields, Bramcote, Notts, on Nov. 18 in his 77th year. Until four days previously he had been in active practice, and one remembers him once saying he hoped he would meet his end just in this fashion. After graduating at Manchester University and holding various house appointments, Buckley engaged in general practice in Nottingham. His interests were attracted to venereology, and by 1914 this specialty made up about half of his practice. When in the R.A.M.C. his work was confined to venereology, and in 1917 he was released for the purpose of starting the Nottingham Clinic. Under his direction the clinic was organized and expanded until it became one of the most important of provincial treatment centres. He was also in charge of clinics at Mansfield and (for a time) at Newark, and carried on a large private practice. Although he retired from the Nottingham Clinic in 1938 his activities were not greatly reduced, and he actually opened a new centre recently at Worksop. Those who have worked with Buckley will always remember his great store of energy and excellent organizing abilities. Good-tempered and kindly, he did not suffer fools gladly, and this combination enabled him to run a large clinic with the minimum of friction. He played an important part in the growth of venereology as a specialty, and although he did not write many articles his influence was felt in the committee room as a sound and practical planner who was really able to make things work. In his spare time Buckley bred racing pigeons, and secured many successes, notably in long-distance races from San Sebastian. During the last two wars the pigeons were used for military purposes. He was president of the National Flying Club for many years. He is survived by a son and daughter.—A. D. F.

Dr. THOMAS AUBREY, born in 1876, died suddenly and peacefully on Nov. 23 of heart failure. He had an attack of coronary thrombosis three years ago; after a few months he resumed his full activities in a very busy practice. The eldest son of Thomas Aubrey, F.R.C.V.S., of Bath, he was educated at Berkhamsted, Bristol University, where he had a brilliant career as a medical student, and St. Bartholomew's; he obtained the Conjoint diplomas in 1899 and the M.B.Lond. in 1902. He practised at Isleham, Cambs, and Bridgwater before settling at Bitton, Glos, in 1905. He was district medical officer for Bitton, Kelston, and North Stoke, and medical officer to Mangotsfield and Warmley Joint Isolation Hospital, and for many years M.O.H., Warmley Rural District Council. He had also been surgeon to the Post Office, casualty officer, Bristol General Hospital, clinical assistant, Brompton Chest Hospital, and junior clinical assistant, Golden Square Throat Hospital. He married in 1900 Mia Isabel Castle, by whom he had one daughter, who died in the influenza epidemic of 1918, and one son, acting wing commander, medical, who lost his life on active service in North Africa in 1943. Mr. Beardmore writes: "It is almost impossible to overestimate the esteem and affection in which Dr. Aubrey was held by the people of Bitton and district, the scene of his labours for the last forty years. He was so much more than their doctor—he was their counsellor and intimate personal friend, and on the autumn day on which he was laid to rest the social and industrial life of the district was stilled, the church was full, the path to the grave was lined, and in the village the children from the school and the workmen from the mill stood with bare heads to pay their silent homage to one of the ablest and best-loved men of his generation and station." Dr. D. I. Jones writes: "His was a dynamic personality. An intensive application to practical work every minute of the day and every day of the week, up to his last living day, did not prevent his being up to date in all

details of modern knowledge and technique, and *au fait* with affairs, local and general, of everyday life. His practical knowledge of illness, of its treatment, and of folk great and small with whom he dealt daily, was phenomenal."

Dr. ERNEST WILLIAM SHAW HUGHES died in retirement at his home in Pinner, Middlesex, on Nov. 23. He was born in 1870, eldest son of the Rev. T. A. A. Hughes, Vicar of Shelf, near Halifax, and was educated at Bradford Grammar School and the Leeds Medical School. After qualifying M.R.C.S., L.R.C.P. in 1893 he was for a short time assistant to Dr. Hector at Drighlington, near Leeds, and then set up in practice in 1896 at Lee Mount, Halifax, and continued there until he retired in 1929. Dr. Hughes was a very active member of the local Division of the B.M.A., which he joined in 1901, and held office as chairman and secretary on several occasions. He was also for many years a member of the Halifax Panel Committee. A pioneer motorist, he used a motor cycle in his practice before the end of the last century, and was a founder-member of the Halifax Automobile Club. During the war of 1914–18 he held a temporary commission for a year in the R.A.M.C. and saw service in Malta and in a hospital ship serving the Salonika front. He died after a short illness, and leaves a widow and one son, Dr. F. L. A. Hughes, who is in practice at Malton, Yorkshire.

Dr. ERNEST ALSAGER PARSONS, who died in Birmingham on Nov. 23, aged 77, was the third son of C. W. Parsons, of Austrey, Warwickshire. Educated at Appleby Magna Grammar School, and apprenticed to a Coventry pharmacist, he later took up an appointment in Rome. Returning to England in 1893, he studied medicine at Mason's College, Birmingham, and Westminster Hospital, and on qualifying M.R.C.S., L.R.C.P. in 1899 entered the service of the Telegraph Construction and Maintenance Company, and served as medical officer on a ship laying cable to St. Helena. He offered his services in the South African War, and joined Sir Frederick Carrington's Rhodesia Field Force. After the war he became senior medical officer to the Beira and Mashonaland Railway Company, an appointment he held until 1907. In 1908 he was employed as one of the medical officers on Sir John Aird's works in connexion with the Assuan Dam extension, in which capacity his command of the Italian language was valuable on account of the large amount of Italian labour engaged. Unfortunately his health broke down and he had to return to this country. On his recovery he joined the staff of Queen's Hospital, Birmingham, eventually becoming the senior resident medical officer. After the 1914–18 war he served as a member of the local Pensions Board. For the last twenty years he had been in private practice in Birmingham.

The death of Dr. THOMAS WILLIAM NAYLOR BARLOW, O.B.E., of Wallasey, at the age of 77, deprives his profession of a man with a long and honourable record. He was M.R.C.S., L.R.C.P., D.P.H. of Cambridge, F.R.S. of Edinburgh, and a barrister-at-law. He retired from his post as medical officer of health at Wallasey in March, 1934. He was president of the Society of Medical Officers of Health 1923–4, and was for many years a very active and popular member of that society. He was a member of the Public Health Committee, and several sub-committees, of the B.M.A. from 1923 to 1931. He was a member of the Committee on Medical Aspects of Abortion 1934–6, and represented his Division at the A.R.M. in 1926 and in 1939. He was secretary of the Section of State Medicine and Industrial Diseases at the Annual Meeting at Liverpool in 1912, and vice-president of the Section of Public Medicine at Bath in 1925. In his later years he suffered greatly from rheumatoid arthritis and was thus prevented from taking an active part in medical affairs. Though unknown to many of the present generation, he will be well remembered by his contemporaries as an able medical officer of health, a genial companion, and as a man always willing and able to co-operate with his fellows in other branches of the profession.

The following appreciation of the late Dr. HENRY ERNEST RUTHERFORD, of Larne, Co. Antrim, who died on Nov. 30, has been received from a colleague: By Dr. Rutherford's death Larne and district have lost an outstanding personality. One had only to know his qualifications to appreciate the fact that he was a man of many parts. As a graduate of arts, law, and medicine, he held a unique position among the medical men of Ulster. His outstanding characteristic was the keen interest he took in the welfare of his fellow men, an interest which he maintained until the end. A cultured man and a great reader, he had a sense of humour which made him take a kindly view of the failings of humanity.

The Services

Col. A. H. Harty, C.I.E., V.H.S., I.M.S., has been appointed Honorary Physician to the King in succession to Major-Gen. W. C. Paton, C.I.E., M.C., I.M.S.(ret.).

The following appointments, awards, and mentions in dispatches have been announced for distinguished service during the war in Europe:

C.B.E. (*Military Division*).—Surg. Capt. J. F. Ainley, R.N. (ret.).
O.B.E. (*Military Division*).—Surg. Cmdr. J. V. Dockray, R.N.V.R. (ret.).
D.S.C.—Temp. Surg. Lieuts. P. M. Kerr and H. R. Shepherd, R.N.V.R.
Mentioned in Dispatches.—Acting Surg. Cmdr. C. Ommanney-Davis, R.N. (ret.); Temp. Acting Surg. Lieut.-Cmdrs. H. O. Paton, J. F. Ryan, and J. K. G. Way, and Temp. Surg. Lieuts. G. A. Findlay and G. K. H. Hodgkin, R.N.V.R.

CASUALTIES IN THE MEDICAL SERVICES

Died.—Col. Sidney John Liddon Lindeman, O.B.E., M.C., R.A.M.C.

Previously reported prisoner of war, now believed to have been lost in Japanese transport in Oct., 1942.—Capt. Bernard Henry Mooring Aldridge, R.A.M.C.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

V. B. Wigglesworth, M.D., F.R.S., of Gonville and Caius College, has been appointed Reader in Entomology. Dr. Wigglesworth is at present Reader in Medical Entomology at the London School of Hygiene and Tropical Medicine, and Director of the Agricultural Research Council Unit on Insect Physiology.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At the annual meeting of the College, held on Dec. 6, Prof. David Murray Lyon was elected President, and Dr. W. D. D. Small, Prof. L. S. P. Davidson, Drs. J. D. S. Cameron, H. L. Wallace, and I. G. W. Hill, and Prof. D. K. Henderson were elected to form the Council for the ensuing year. Dr. Small was nominated Vice-President.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

Dr. Robert A. McCance, F.R.C.P., will deliver the Dr. James Finlayson Memorial Lecture in the hall of the Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, on Wednesday, Jan. 9, at 4 p.m. The title of the lecture is "Bread."

Medical News

University College, Southampton, has been holding this week, in conjunction with the British Council, a leave course on "Britain To-day and To-morrow," for members of the Dominions, United States, and Polish Forces, at South Hill, Gleneyre Road, Bassett, Southampton. To-day (Friday, Dec. 21), at 11.45 a.m., Dr. W. P. Cargill lectures on "The Health of Britain."

A general course for demobilized general practitioners has been arranged to begin on Monday, Dec. 31, at Bristol University. It will last a fortnight. The detailed programme has not yet been drawn up, but the course will be essentially clinical. Particular emphasis will be laid on paediatrics and maternity. Other subjects to be included are mental deficiency, public health with fevers, and pulmonary diseases, including tuberculosis. Accommodation will be provided at a University Hall of Residence (Wills' Hall) at a charge of 15s. per day plus 10% for gratuities.

The French Academy of Medicine has elected Sir Alexander Fleming an Associate Member in recognition of his services to medicine by the discovery of penicillin. He shared the honour of election with, among others, Sir Henry Dale, Prof. E. D. Adrian, and Prof. C. H. Best (Toronto); and Sir Wilson Jameson has been elected a Foreign Correspondent of the Academy.

Dr. W. S. C. Copeman has been elected chairman of the Council of the Chartered Society of Physiotherapy in succession to Sir Herbert L. Eason, who has resigned.

As the result of recommendations made by a joint committee of the British Institute of Radiology and the Faculty of Radiologists, the Faculty is setting up an Information Bureau at 45, Lincoln's Inn Fields, London, W.C.2 (Chancery 6965) to assist officers who have served as radiologists in H.M. Forces in obtaining information regarding further training and appointments vacant. The Faculty therefore invites inquiries from such radiologists and is prepared to receive particulars from hospitals requiring radiological staff.

The Ministry of Health states that it has now been agreed by the Service Departments that they will accept liability for the cost of sanatorium treatment of members of the Forces, for the period of such treatment preceding the date of discharge from the Forces, on the same basis as applies between a sanatorium authority and the Ministry of Pensions with regard to the cost of treatment after discharge.

Dr. Robert Noel McKinstry, Medical Officer of Health, Jersey, and Dr. Angelo Nelson Symons, Health Officer, States of Guernsey, have been appointed O.B.E. (Civil Division) for services rendered during the enemy occupation of the Channel Islands.

Dr. Colin Fraser Brockington, at present county medical officer of health for Warwickshire, has been appointed county medical officer for the West Riding of Yorkshire.

Dr. Robert Courrier, professor at the Collège de France and member of the Académie de Médecine, has been elected a member of the Académie des Sciences.

Lord Nuffield, already a munificent benefactor of Worcester College, Oxford, has presented a further sum of £10,000 for the endowment of scholarships for medical students.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* there was a rise in the incidence of infectious diseases. The largest increases were acute pneumonia 167, whooping-cough 152, measles 48, diphtheria 22; while the only fall was scarlet fever 32.

The only local rise of any size in the incidence of acute pneumonia was Yorks West Riding 76; slightly more than half the total cases notified in this county were recorded in Sheffield C.B. The largest rises in diphtheria were Suffolk 13, Durham 16, Yorks West Riding 12, Essex 11.

The whooping-cough increase was fairly general, and the only rise of note was Essex 31. The increase in measles was contributed by only a few counties; the largest rises were Norfolk 37, and Lancashire 24.

A fresh outbreak of dysentery was reported from Berkshire, Abingdon R.D. 22 cases. The other large returns were Lancashire 40, Surrey 34, Essex 24, London 21, Gloucestershire 19, Glamorganshire 14.

In *Scotland* infectious diseases were more prevalent during the week. The rises included acute primary pneumonia 57, measles 28, scarlet fever 30, dysentery 18, diphtheria 15. The largest rise in diphtheria was that for the city of Glasgow 26. The chief centres of dysentery were Glasgow 26, Renfrew County 16, and Edinburgh 12.

In *Eire* the outbreak of measles in Dublin C.B. showed a further increase; 160 cases were notified during the week. There were 48 cases of diarrhoea and enteritis notified, this disease having been at a practically constant level during the past five weeks.

In *Northern Ireland* a decrease of 11 in the total for scarlet fever was the only change of note in the trends of infectious diseases.

The Health of Bengal, 1941

The birth rate during the year was 31.9 per thousand, and was 5.3% below the rate for 1940. The death rate was 23.7 per thousand, and was 6.6% higher than that of the previous year. The simultaneous deterioration of birth and death rates is a rare event; the last two occasions were 1918 and 1938. Excluding "other classes" the Muslims had the highest birth rate (32.1) and the highest death rate (24.6). Infant mortality was 156 per thousand live births, compared with 159 in the previous year. A general increase was recorded in epidemic diseases. The chief causes of death were malaria 388,381 deaths (12.8% of the total deaths recorded), cholera 61,879, smallpox 11,250, kara-azar 16,349, and dysentery and diarrhoea 51,529.

Week Ending December 8

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,779, whooping-cough 1,225, diphtheria 574, measles 611, acute pneumonia 744, cerebrospinal fever 41, acute poliomyelitis 28, dysentery 242, and typhoid 5.

No. 48

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 1.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.
Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.
A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	45	1	17	5	1	39	2	25	1	—
Deaths		—	2				—	2		
Diphtheria	676	33	221	89	18	637	19	173	122	20
Deaths	10	—	—	5	—	13	—	6	—	—
Dysentery	231	21	68	—	—	381	29	85	—	2
Deaths				—	—				—	—
Encephalitis lethargica, acute	2	—	—	—	—	1	—	—	—	—
Deaths		—					—			
Erysipelas			56	17	9			56	11	2
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				48					17	
Deaths	39	2	14	9	—	31	5	8	19	1
Measles*	501	43	109	168	—	7,810	84	297	36	273
Deaths	—	—	1	1	—	10	—	—	—	—
Ophthalmia neonatorum	64	5	9	—	—	64	4	15	1	—
Deaths										
Paratyphoid fever	6	—	3(B)	—	—	3	—	2(B)	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	746	41	5	2	7	761	27	10	3	4
Deaths (from influenza)	30	7	1	1	—	27	1	5	—	—
Pneumonia, primary			238	44				284	16	
Deaths		33		12	4		—		13	13
Polio-encephalitis, acute	5	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	20	1	—	1	—	10	—	3	1	—
Deaths		—					—			
Puerperal fever		4	21		—		5	12		—
Deaths										
Puerperal pyrexia‡	142	7	12	1	—	134	9	14	1	2
Deaths		1					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,879	163	314	17	42	2,279	71	343	47	71
Deaths	2	—	—	—	—	1	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	12	1	1	5	1	7	1	2	10	1
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,384	79	42	41	3	1,474	49	130	33	9
Deaths	9	—	2	2	—	9	1	4	2	1
Deaths (0–1 year) Infant mortality rate (per 1,000 live births)	344	38	54	36	10	345	38	62	43	17
Deaths (excluding still-births)	4,703	739	613	199	107	4,743	782	636	220	139
Annual death rate (per 1,000 persons living)			13·9	12·8	§			14·6	14·3	§
Live births	6,561	895	808	370	217	6,685	611	853	322	255
Annual rate per 1,000 persons living			16·2	23·9	§			17·3	20·9	§
Stillbirths	209	20	29			220	18	29		
Rate per 1,000 total births (including stillborn)			35					33		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.
† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
‡ Includes puerperal fever for England and Wales and Eire.
§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Letters, Notes, and Answers

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ANY QUESTIONS?

Nodule at Site of A.P.T. Injection

Q.—*What is the cause of the small nodule which often appears at the site of A.P.T. injection? Has its size any relation to the degree of immunity that may be expected?*

A.—The difference between alum-precipitated and other toxoids is that alum precipitation renders toxoid much more insoluble. It is therefore more slowly absorbed and hence can be given in more concentrated form; this is the reason for its greater efficacy. The nodule referred to is a depot of the material itself, with a surrounding area of leucocytic infiltration. Neither the intensity of the initial inflammatory reaction nor the size of the nodule persisting thereafter bears any relation to the degree of immunity produced. Sensitiveness to this product, which determines the degree of local reaction produced by it, has no connexion whatever with immunity. This reaction is usually slight in children, who tend to be highly susceptible, and often much more severe in adults, who in general have a higher degree of partial immunity.

Treatment of Syphilis

Q.—*A man contracted syphilis at the age of 16, was treated, and thought himself cured. Symptoms recurred when he was 22, and he had "mercurial treatment." Now at 47 he has an ulcer on the border of the tongue, with a small yellow slough in the centre. A specialist agrees that it does not look carcinomatous, but will take a section for microscopical examination. The Wassermann is positive (1 in 4 dilution). I have prescribed pot. iod. 20 grains daily (and will increase to 40 grains in three weeks), and an injection of oil-soluble bismuth weekly. Would metallic bismuth suspended in glucose be better? Would a trivalent intravenous arsenic injection make his liver a mass of fibrous tissue?*

A.—It appears probable that the lesion is a gumma, but a biopsy should be carried out to exclude malignant disease. Oil-soluble bismuth is normally used when a rapid therapeutic effect is desired, a suspension of the metal when a slow prolonged effect is the object; in this case the latter preparation seems preferable. The suggestion that "a trivalent intravenous arsenic injection" might "make his liver a mass of fibrous tissue" is absurd. This would only happen if he developed (infectious) hepatitis, which can almost certainly be avoided by employing a strictly aseptic technique. At first neoarsphenamine should be given intravenously, in weekly doses of 0.6 g., concurrently with the bismuth, a careful watch being kept for toxic effects; later, bismuth may be used alone. If the ulcer proves malignant, antisyphilitic treatment should be carried out as soon as the patient has recovered from any operation; it would be as well to have the cerebrospinal fluid examined, and if asymptomatic neurosyphilis is present treatment should be modified accordingly.

Weight of Enlarged Prostates

Q.—*What is the average weight of prostates removed for adenomatous enlargement? What is the weight of the heaviest one that has been removed?*

A.—The average weight is 1½ to 3 oz., and 6 oz. is a large one. So far as the writer knows, 18½ oz. is the heaviest ever removed.

Tuberculin-tested Milk

Q.—*If the producer of tuberculin-tested milk bottles it and delivers it himself, is he free from the obligation to state on the bottle or the seal that it is tuberculin-tested milk?*

A.—If a vendor of tuberculin-tested milk sells it specifically under this designation it must be labelled according to the Order, whether he produces the milk himself or not. If he bottles it on the farm he is entitled to add the term "(Certified)" to the designation "Tuberculin-tested Milk." There is, however, no obligation on any vendor to label milk as tuberculin-tested merely because it is from a tuberculin-tested herd and because he is licensed to sell milk under the designation, so long as he sells it as milk without any designation and demands no extra price for it.

Sudeck's Arthritis

Q.—*What is the aetiology, particularly in relation to injury, of Sudeck's arthritis or atrophy of hand and other bones?*

A.—It was in 1900 (*Arch. klin. Chir.*, **62,** 147) that Sudeck published his original paper on the dystrophy of bones of the extremities which might follow injury; since then there have been many studies of the subject, including another excellent article by Sudeck himself in 1938 in the same journal (*Arch. klin. Chir.*, **191,** 710).

The condition usually follows minor injuries or sprains. The symptoms are persistent burning pain, oedema of the subcutaneous and periarticular tissues, and redness of the skin, followed later by shrinking of the oedematous parts, stiffness of the joints, and atrophy of the bones of the affected extremity. The pathology is not fully understood. The condition has been termed acute reflex bone atrophy, on the assumption that the vasodilatation which is responsible for the bone absorption and atrophy is due to a nervous reflex originating at the site of injury. This view would appear to be confirmed by the testimony of many who have shown that the pain may be abolished, or at least greatly diminished, and the later crippling effects largely prevented, by section of the sympathetic supply above the site of the lesion. There are difficulties in the way of accepting this view. Stimulation of the proximal end of a peripheral nerve usually leads to vasoconstriction, and section of the sympathetic should cause vasodilatation—a condition which already exists in Sudeck's disease and in the somewhat similar condition causalgia. Lewis showed that in causalgia the redness, heat, and tenderness were due to the local effect of substances liberated peripherally, and some observers consider that a similar mechanism may be responsible for the vasodilatation in Sudeck's atrophy. The matter is still in need of further research to determine the correct pathology.

It is important to make an early diagnosis if disability is to be prevented. When there continues to be complaint of persistent burning pain and one observes periarticular oedema in a case of sprain, contusion, or wound, which is not septic and has been properly immobilized, one must always bear in mind the possibility of reflex bone atrophy. The pain may be relieved or abolished, and the possibility of bone absorption and atrophy diminished, by section of the sympathetic above the lesion, by means of local infiltration, paravertebral injection, periarterial sympathectomy, or by ganglionectomy.

Soapless Shampoos

Q.—*Many of my patients wash their hair with soapless shampoos. What is soapless shampoo, and is it harmless?*

A.—Soapless shampoos consist of sulphonated oils and sulphonated higher fatty alcohols. They are harmless on a healthy scalp.

Signs of Virginity

Q.—*What are the signs of virginity in a girl under 15 years? What would be the changes after one, and after several, connexions?*

A.—The signs of virginity in a girl under 15 are an intact hymen and apposition of the labia majora. Although an intact hymen is the main indication of virginity it is not proof of it, because occasionally intercourse can take place without rupture. Proof of intercourse rests on the demonstration of spermatozoa in the vagina, usually accompanied in first intercourse by rupture of the hymen. When the hymenal tear has healed no just opinion can be given as to the number of times connexion has occurred, but in the woman habituated to intercourse over a number of years the labia majora will not remain in apposition and the introitus tends to gape. One is not justified in certifying that intercourse has taken place from the observation of a healed rupture of the hymen alone.

Thought and the Electro-encephalogram

Q.—*In a recent Brains Trust Dr. Julian Huxley implied that the electro-encephalogram provided evidence that thinking was accompanied by a mechanical process in the nervous system. Is this so?*

A.—No, it is not, but if "physical" were substituted for "mechanical" the statement might possibly be defended. No one would doubt that thought is associated with electrical changes in the brain, but there are no "mechanical" concomitants of these changes. Even so, the electro-encephalogram gives little or no evidence about the processes involved in thought. There is the negative observation that many of the electrical oscillations observed in the E.E.G. cease during periods of attention or thought, but this is probably unrelated to the electrical activity upon which the transmission of impulses subserving thought depend. There are also the abnormal rhythms which are associated with abnormal thought and behaviour, as in epileptics and psychopaths, but here again no evidence is provided upon the nature of thinking. The E.E.G., in

fact, gives a record of a crude end-result of the living activity of brain cells, but there is no evidence that the changes in any way reflect brain function.

The "Highly Strung" Child

Q.—*How should one manage and treat a "highly strung" 4-year-old?*

A.—At 4 years old troubles of many kinds are normal concomitants of development. The anxiety of good parents, who blame themselves when their children are difficult, often raises tension in the home to a point unbearable to both sides, and a statement by the doctor that at this age emotional upsets are as much to be expected as was teething at an earlier stage will often bring much relief to father and mother, and through them to the children. Freedom from anxiety in the adults, insight into the causes of strain in the child, together with love, toleration, and supporting control, form the basis of good home management. At the age of 4 a child is working out his relationships with parents, siblings, and outsiders; he is experiencing a healthy rivalry with the adult world, while increasingly conscious and impatient of his own limitations. He is greedy both for power and for protecting love, and is haunted by fantasies in which through gaining power he becomes dangerous and so provokes anger in the parents whose love is vital to him. Such a "normal" conflict is painful, especially if exacerbated by such traumata as illness, separation from the mother, etc. Many naughtinesses, feeding difficulties, tempers, and disorders of habit may represent the question, "Do you love me even if I am horrid?" while the harsh self-criticism, felt though not verbally expressible in early childhood, makes it hard to accept reassurance till many times repeated in word and act. A clever mother can do much by encouraging independence combined with protectiveness towards herself, and by tranquilly accepting boasts. The small boy in *When We were Very Young* who warned his mother, "You must never go down to the end of the town unless you go down with ME," was solving his problem in this way, and asking her admiration of him as protective male. At this age, when boys become defiantly masculine, fathers can help to allay conflicts by inviting partnership in various activities, as can mothers with little girls, whose developing maternal instincts and love towards the father will otherwise arouse the anxiety associated with rivalry and guilt.

Play is an important factor in mental health. Large toys, such as wooden engines and trucks, a set of bricks, sand and water, and other material for imaginative play are valuable, as are simple constructional toys that develop skills and provide satisfaction through achievement. A highly strung hyperactive child is often afraid of his own aggressive impulses, and so finds comfort in external control of a gentle kind. If he is unhappy, showing physical symptoms that appear psychogenic, or if his difficulties are inappropriate to his developmental stage, it is likely that he needs child-guidance treatment. As a first-aid measure, however, it is sometimes worth trying phenobarbitone, gr. 1/8 to 1/2, morning and evening, which may provide sufficient mental relief to enable a child to work through his problems with the aid of improved management at home.

Symptomatic Treatment of Cough

Q.—*What is the symptomatic treatment of cough in cases of pneumonia?*

A.—Cough in pneumonia requires treatment: (1) if the cough is unproductive and interfering with the patient's comfort or rest; (2) when the cough is productive but the sputum is so viscid that the cough exhausts the patient without adequate result.

When the cough is not productive it is useless and should be damped down. The milder degrees are best dealt with by the use of a codeine linctus containing, e.g., codeine phosphate (gr. 1/16 to gr. 1/8), every four hours. For the more severe types linctus heroin. (gr. 1/32 to gr. 1/8) should be used sufficiently often to produce the required result. Often the unproductive cough requires treatment not so much in itself as because of the pain it causes; in these cases the pain rather than the cough should be treated.

When the cough is productive warm alkaline draughts (sod. chlor. and sod. bicarb. āā gr. 15 in 2 oz. of warm water, four-hourly) are most useful. With these a mixture of old matured tinct. camph. co. and oxymel of squill āā gr. 30 should be given. This has been proved to have an expectorant action as well as making the cough less frequent. In some of these cases there is an element of spasm, and small doses of pot. iod. and stramonium are of value.

Diet in Chronic Interstitial Nephritis

Q.—*Please describe the modern dietetic treatment for chronic interstitial nephritis, with raised blood pressure and oedema of the eyelids in the morning.*

A.—The chief aim of modern dietetic treatment is to maintain nutrition without making unnecessary demands on kidneys which are diminished in function as well as structure. The principles of the diet are as follows: (1) Abundant fluids to satisfy thirst and to maintain the beneficial polyuria. (2) Enough food to provide an energy value of 2,000 calories, unless obesity indicates a reducing diet. (3) Enough protein to prevent depletion of body proteins. About 70 g. daily should be enough unless there is heavy albuminuria, when protein intake should be increased. (4) Enough milk, fruit, and vegetables, which produce an alkaline ash, to oppose the common retention of predominantly acid protein end-products. When obtainable, two pints of milk daily form a good foundation for this diet, providing 40 g. of protein yet contributing to the alkaline ash balance. Details of the reaction of ashed food products are given in M.R.C. Special Report Series No. 235, 1940, by R. A. McCance and E. M. Widdowson. (5) Salt according to the patient's taste unless there is good reason to differ from him. If there is a tendency for oedema to occur, as in this case, surplus salt should be avoided and no salt added to the food apart from the normal amount used in cooking. Salt depletion is a grave danger in chronic interstitial nephritis because it may promote dehydration and unmask uraemia.

Tuberculosis and Diabetes

Q.—*Is there any evidence that a high blood sugar is harmful in the absence of ketosis in pulmonary tuberculosis complicating diabetes mellitus? Many young diabetics remain well on an uncontrolled diet with insulin; the urine is sugar-free in the mornings but hyperglycaemia and glycosuria occur after meals without ketonuria, as judged by the sensitive nitroprusside test; symptoms of diabetes are absent and weight is maintained. Is the non-restricted diet with insulin, allowing hyperglycaemia and glycosuria without ketonuria, permissible in the diabetic case of pulmonary tuberculosis?*

A.—This question raises two problems:

(1) Does a high blood sugar render patients more liable to develop other diseases? It is believed that this is the case, but the proof is not conclusive. Diabetes is always considered one of the causes of sciatica, but sciatica is rarely seen in patients whose blood sugar is reasonably well controlled with insulin. Boils and carbuncles are believed to be more common in the untreated diabetic, but it is difficult to be certain on this point. Tuberculosis is a well-known complication of diabetes, and a careful watch for this must be kept on all patients whether the blood sugar is well or badly controlled, though the impression is gained that it is commoner in the latter.

(2) Does a high blood sugar tend to make the progress of another disease more rapid? The answer in this case can be more definite, for there is no doubt that a disease like tuberculosis of the lungs will progress more rapidly if the diabetes is uncontrolled. This is true of all skin conditions, and of all septic and gangrenous conditions, and every effort should be made to control the diabetes. It may not be possible to abolish the glycosuria entirely if the diabetes is difficult to control, and the fear of hypoglycaemic attacks is, I suspect, the reason for the question being asked. Hypoglycaemia may be due to two main causes. (*a*) The improvement in the lung disease may cause a diminished demand for insulin. This decrease is a good sign, since it shows that the lung disease is being better controlled. The care of a patient in a hypoglycaemic attack is simple, should be easily provided in a sanatorium, and should not, therefore, be feared in any way. It can cause difficulties only when patients do not recognize the early symptoms and have severe and unexpected attacks. These patients are fortunately few in number and in them glycosuria must be allowed, but it is a pity to allow glycosuria (even without ketosis) in all types of patients because of the fear of hypoglycaemia. (*b*) Attacks of hypoglycaemia may be due to errors in diet. It is most important that the diet should be supervised by a trained dietitian. This will ensure throughout the sanatorium a diet which is varied and well chosen. The diabetics will get a diet in which the carbohydrates are reasonably constant and well varied. The exact amount of carbohydrate which each patient needs must be discovered, whether it be 150 g. at a time when the appetite is poor, or 300 g. or more when the condition is improving. Sufficient insulin must be given to control the glycosuria so far as possible. If this can be achieved the patient will have the best chance of recovering from his lung disease, and surely the best is what he should be given, even at the expense of some extra trouble.

INCOME TAX

Amount of Refund Due

V. M. states that in the year to April 5, 1945, he earned £241 "pay" and had £39 tax deducted therefrom, and in the year to April 5, 1946, he will have earned £426 and have had £127 tax deducted. What refunds will he be entitled to claim?

⁂ On the facts stated—£14 for 1944–5, and £60 for 1945–6. These amounts will be increased if he has a claim to an allowance for the expense of a uniform.

Cost of Postgraduate Course

D. H. is in general practice and is taking a postgraduate course. Can he deduct the expense in calculating his professional profits?

⁂ We are not aware of a specific judicial decision on this point and, as D. H. suggests, there may be some variation in practice as

between one locality and another. Assuming that an expense of so personal a nature is not barred the principle involved seems to be that an expense incurred to *maintain* an existing standard of knowledge is a permissible deduction, but not an expense incurred to *improve* that standard. Obvious analogies are supplied by the application of the same fundamental distinction between "revenue" and "capital" expenditure to such expenses as the replacement of a car or the maintenance of the medical library. (If D. H. had been assessed under Schedule E the answer to his inquiry would almost certainly have been in the negative.)

Replacement of Car

W. K. finds it necessary to replace a ten-year-old car by a new one costing £400. What deduction can he claim?

*** (*a*) If he has not claimed and been allowed in the past a deduction for depreciation of the old car W. K. can claim to deduct as an expense the cost of replacement. That cost will be £400 less the amount (if any) received for the old car. (*b*) If he has been allowed depreciation, he cannot claim the cost of renewal, but can claim to deduct as an expense the excess of the cost of the old car over the total allowances for depreciation, and can also claim depreciation on the cost of the new car.

Sickness Insurance Benefit

"DELTA" inquires whether an annual amount payable under a sickness policy is liable to income tax.

*** We are not aware of any specific judicial decision on this point, but we understand that such sums are not liable to tax unless there are some special features bringing the payments into the scope of the tax.

Payment in Lieu of Board and Lodging

P. L. was engaged as an assistant at a salary of £425 per annum, it being understood that board and lodging would be provided. The employer was, however, unable to find accommodation in his own house and paid P. L. an additional £4 4s. a week in lieu thereof. Is this £4 4s. liable to tax?

*** Yes. The original agreement appears to have been replaced by the later one under which P. L. agreed to receive the £4 4s. weekly in cash, and that amount is "income" liable to tax.

LETTERS, NOTES, ETC.

Permanent Holiday Camps for Children?

Miss E. FRANCIS-MOSS (c/o 61, Oaklands Road, Cricklewood, N.W.2) writes: Evacuation of the city children to the country improved the health of the children immensely, and those who have returned to London since VE-Day were bonny, plump, well-developed children, who had learned to love the country, its open spaces and fresh air. Now they play in the streets and on bombed property, and fling bricks at each other for the sake of something to do. Is all the benefit that these children have gained through evacuation and country life to be thus lost, and are they to go back to the same low standards of health and development from which we took them? What use are all our educational plans and advantages if the individuals who should benefit cannot do so, owing to tiredness and listlessness due to a low standard of health? Cannot we arrange that the long summer vacation may be utilized with advantage, and that every city child has at least a month in the country? There are many Service camps and hostels all over the country at the present time which could be utilized for the scheme. Men and women of wide experience and ability would be needed to supervise the camps and to give helpful advice to the various personnel. Retired teachers would do this admirably. Students from our colleges and universities would probably volunteer to supervise the children and their activities, and students from the domestic science departments of our universities might manage the domestic part with the help of local employees, and would themselves gain much good experience. The W.V.S. would probably also help in the scheme. The scheme might mean a small increase in the rates, but surely it would be worth a little expense to see our children healthy and happy. In the long run it would be a gain, for the more spent in the prevention of sickness the less spent in the curing of it. I shall be pleased to receive any criticisms and remarks readers may wish to make.

Knyveton's "Diary of a Surgeon"

Major SAUL JARCHO, M.C., A.U.S., writes from the Office of the Surgeon General, Washington: The question of the authenticity of Knyveton's *Diary of a Surgeon in the Year 1751–2* was raised anew by one of your correspondents (April 21, 1945) and drew interesting replies from Prof. Miles Phillips and Dr. J. F. Blackett (May 19). May I take the liberty of calling attention to certain linguistic anachronisms which definitely establish the spuriousness of the *Diary*. These were noticed in the *New York Times Book Review*, Dec. 12, 1937: "... the author speaks of 'passers by,' whereas the eighteenth century would almost certainly have said 'passengers.' Other lapses are 'jungle,' which did not enter the language till 1776, 'pugilist' (1790), 'riddled' (1849), 'realistic' (1856), and 'intrigued,' which in the signification of 'interested' was first used in 1905."

Liver Extracts

Mr. W. B. EMERY writes from Glaxo Laboratories: I have only just seen in your issue of Oct. 6 a reply given under the heading of "Any Questions?" to a query about the use of liver extracts in aplastic anaemia or essential thrombocytopenia. First, you stated that refined extracts were more reliable than crude, due to greater care in clinical testing. We have already referred in some detail in a recent paper published in the *Journal* (Jan. 20, 1945, p. 75) to the differences between crude and refined extracts, and have indicated there that our crude extract is expected to pass the same rigid criteria of potency which are applied to our refined extract. In fact, every batch of both extracts is subjected to at least one and in many cases two or three separate clinical tests, albeit at different dose levels, consistent with the fact that refined liver extracts will produce satisfactory responses in much smaller dosage than crude liver extracts. Next, you stated that intensive liver treatment in a case of refractory pernicious anaemia would formerly have implied 4 c.cm. of refined liver extract every day. I think you would find on inquiry that the vast majority of doctors in this country would almost certainly not use a refined liver extract for *intensive* therapy, but that a crude extract would normally be used. This is probably chiefly a matter of prejudice, persisting from the time when refined extracts tended to be rather untrustworthy. In either case I would contend that a dose of 2 c.cm. of a *refined* liver extract every alternate day would be ample for any intensive course of treatment, and, with many extracts at present available, including our own, even this would be grossly excessive. The use of larger amounts would merely be a waste of liver. The statement that the injections would be supplemented to-day by oral proteolysed liver extract seems to be based only on the comparatively few cases recently reported by Davidson and his colleagues. So far as I am aware there is no evidence that oral therapy with dried stomach would not achieve the same results. I would also point out that oral therapy of any kind is very much more costly and wasteful of liver than parenteral therapy, which should certainly be tried in the first place.

Destruction of Adult Schistosomes in Man

Dr. F. GORDON CAWSTON writes from Durban: Evidence of the death of the male schistosomes through applying a course of antimony injections containing less than 0.75 g. of the metal, as first used by Dr. J. B. Christopherson in 1917, is far from conclusive. Without confirmatory signs the complement-fixation test is of no more value than a record of the eosinophils during and subsequent to treatment, and investigations are needed to show how far these apply to each sex. Before a line of treatment can rightly be enforced on native labourers such evidence of successful cure is desirable lest the dislodgment of the worms in the blood stream may result in obscure pathological conditions. A Transvaal district surgeon has raised the question how far it is best to leave patients untreated where a thorough course cannot be assured, and I have sometimes hesitated to do more than keep severe cystitis under control in little Indian girls of only a few months of age whose mothers relied on a badly infested pool for their water supply, thus hoping for the development of a natural immunity in due course. Microbic invasion spreading up from the bladder, especially following gonorrhoea and instrumental treatment before the parasites are dead, is the cause of most of the trouble in the ureter and kidneys, where, although ova are not uncommon as they are in the appendix, the adult worms seldom if ever occur.

Podophyllin for Warts

Capt. G. W. CSONKA, R.A.M.C., writes: In your "Any Questions?" column (Oct. 27, p. 592) a 25% suspension of podophyllin in mineral oil is recommended for the treatment of soft warts. I have had some experience with this method when treating condylomata acuminata, and was soon forced to modify it due to the frequency and sometimes severity of the chemical balanitis which followed. First I used 5% podophyllin powder in tannic acid, as advised by Major H. Haber, R.A.M.C., and had no reactions; the effect on the warts was definitely less strong. I now use 10% podophyllin in liquid paraffin, and tell the patient to wash the area in four hours. All but two cases responded gratifyingly to the first application, and the failures lost their warts after a second application. It is essential, however, even with this modified treatment, to clear any coexisting balanitis prior to the attack on the warts.

Correction

Dr. J. E. BANNEN writes: In my letter (Nov. 10, p. 665) on "Sequelae of Emphysematous Lung" I did not make myself clear on the differential diagnostic test between pneumoperitoneum and retroperitoneal gas. This should read: In pneumoperitoneum the gaseous sites move to the uppermost limiting parts when the patient is changed from the vertical to the lateral decubitus, but retroperitoneal gas remains fixed in its loose areolar space.